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KARAIKUDI - 630 003

DIRECTORATE OF DISTANCE EDUCATION

M.A.

(CHILD CARE AND EDUCATION)

III - SEMESTER

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EDUCATION OF CHILDREN WITH SPECIAL NEEDS

SYLLABI-BOOK MAPPING TABLE

EDUCATION OF CHILDREN WITH SPECIAL NEEDS

CONTENTS

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BLOCK - I: SPECIAL CHILDREN

UNIT I: CONCEPT OF SPECIAL CHILDREN

STRUCTURE

1.1 INTRODUCTION

We live in a world full of diversities. Every form of living and non-living being is quite unique and different from each other. A child comes to this Earth with its own unique abilities and capacities of body and mind. Some are fortunate enough to have extraordinary abilities or capacities, while others are averages or even suffer from so many deficits and deficiencies since from the birth. This gap between the abilities and capacities of the children related to their learning, adjustment and development found at the time of their birth, may further be widened by the nature of the environmental differences encountered by them in their nourishment and education. It results in labelling them as exceptionally superior or inferior, capable or incapable in one or other aspects of their personality development. Now the question arises how can such a level exceptionality be assigned to them? Who are called Special children? Why are they called so? We shall discuss such issues in this unit.

1.2 OBJECTIVES

After reading this unit, the reader shall be able to

- Understand the concept of Special Children.
- Know the meaning and definition of Special Children.
- Identify the categories of Special Children.
- Develop an insight into handicapped and gifted children.

1.3 CONCEPT OF SPECIAL CHILDREN

With the increased emphasis on human resource development as the key factor in the total development of a country, the need and importance of

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"Education for All" has increased in recent years, it is how realised that in a dynamic society, every individual's endeavour and involvement needs to be ensured for useful social needs. It is the fundamental right of everyone to realize himself, however imperfectly and contribute to the common good, however little. It is worthwhile to remember that "Children with Special Needs" are handicapped under certain circumstances. However, in other situations, the disabled individual, is in fact, a total individual. His bodily and psychological needs, are in no way different from the so-called normal persons. Therefore, our attitude towards "special children" should be changed. For the successful functioning of the programme of "Education for All". Education for children with special needs should be integrated with the education of the abled normal children. This has now become a serious challenge for our teachers, educators, administrators, and all those who are directly or indirectly associated with the programme of education for all.

Now it is generally recognised that children differ widely not only in their motivation and rate or learning but also in their mode of learning. Modern psychology reveals that such individual differences manifest themselves in physical, emotional, intellectual, cultural and social spheres. In technical language individual differences are variations or deviations in mental or physical characteristics noticed among individuals which differentiate them from the average of the group. Therefore, some of the prominent categories of children with special needs and the problems associated with their education are to be studied. It is hoped that such studies will enable the teachers, educators and the parents to meet the educational requirements of special children more adequately and more efficiently.

1.4 MEANING AND DEFINITION OF SPECIAL CHILDREN

Special children are those students who require special education and related services if they are to realise their full human potential. These children are in need of special education because they are markedly different from most children in the classroom in one or more of the following ways. They may have mental retardation, specific learning difficulties, emotional problems, physical disabilities hampering their learning, disordered speech or language, or special gifts or talents. So special children are those children who differ from the average to such an extent that their differences warrant some type of special instruction, either within the regular classroom or in special classes.

Some special children learn to live with their disabilities or special abilities in such ways that surprise most of us. Their differences from most people do not keep them from leading full and normal lives as children or as adults. Sometimes special education plays no role in their lives because their abilities, motivation and support from their families and communities are sufficient to allow them to circumvent their deficiencies without special assistance. But this is not the case with most of the special children and they need special assistance to realise their full human potential.

The term "special" is applied to a trait or to a person possessing the trait if there is a considerable extent of deviation from the normal possession of that trait. These special children differ from the average to such an extent that their differences warrant some type of special instruction either in the

mainstream or in special schools. The differences in the case of special children is only one of degree. The difference lies in learning or behaviour of the child. For example, many students may have vision or hearing impairment, but most of these cases can be corrected with glasses and hearing aids. Only a few may require special helps like large print, magnifiers or Braille materials. Such students who need special instruction can be categorised under special children.

1.4.1. Difference Between Disability and Handicap

Though we use the term 'handicapped' to refer to individuals with disabilities, there is an important distinction between disability and handicap. A disability is an ability to do something. It is a diminished capacity to perform in a specific way. A handicap, on the other hand, is a disadvantage imposed on an individual. A disability may or may not be a handicap, caused by a disability. For example, blindness is a disability that can be anything but a handicap in the dark. In fact, in the dark the person who is not blind is handicapped while the actual blind can move about as usual. Usually, people with handicap are persons who are different from themselves by stereotyping them or not giving them an opportunity to do the things they are able to do. So, we must constantly strive to separate the disability from the handicap. That is, our goal should be to confine their handicap to those characteristics that cannot be changed. We should not impose any further handicap by our attitudes or our unwillingness to accommodate their disability.

Check your Progress - 1

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

1. What do you understand by the term special children?

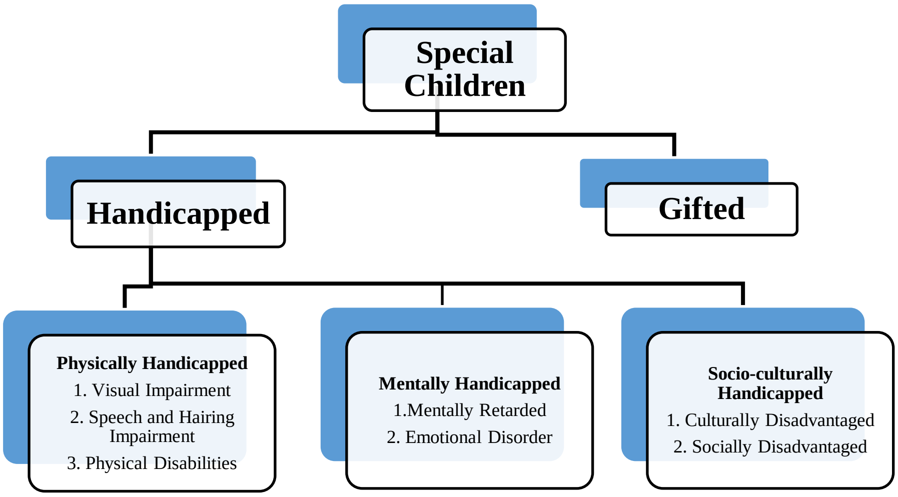
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1.5 CATEGORIES OF SPECIAL CHILDREN

All the special children can be classified into two broad categories as the handicapped and gifted. Again, the handicapped special children can further be classified on the basis of their specific handicaps. Their handicaps may be due to physical attributes, mental attributes, or socio-cultural attributes. Under each subgroup, there are two more specific handicaps. The following classification can be made taking the above discussion of special children into consideration.

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Educationists have classified special children into many broad categories each of them having one or more types. But in our discussion, we follow the above flow chart. The two broad categories and some of the major types are discussed below.

1.6 HANDICAPPED AND GIFTED CHILDREN

1.6.1. Handicapped Children

All the handicapped children are special children. This category is generally known as physically handicapped children. A physically handicapped person is an individual who is affected with a physical impairment which, in some way or the other, limits or inhibits his participation in normal educational activities. In simple words, any person having a disability is called a handicapped person. Sometimes the handicap may be caused by mental and socio-cultural attributes. A disability is an outcome of an objectively defined impairment of structure or function. For example, the loss of vision in one eye or loss of hearing in one ear is a disability.

How far the disability handicaps its possessor largely depends upon the circumstances. There are certain disabilities that do not really operate as a handicap. For example, colour blindness is a handicap for those who are in the profession of navigation or driving. But if they are placed in a job, which does not require colour vision, colour blindness may not be a handicap at all. Stammering is a handicap. For an orator or lawyer scientist. Also, some of the disabilities can be mitigated with the aid of sophisticated instruments like hearing aids and self-propelled chairs of paraplegics.

Generally, a handicap is a partial disability. In special children the disability usually affects one organ, sense or system, the rest remaining impaired, or being even better than the average. The handicap does not necessarily reduce the entire power. For example, a blind with visual impairment may have strong legs, but he will have considerable difficulty in walking in unfamiliar places. It is important to note that some disabilities

can produce secondary handicaps. For example, a child who has normal speech but other severe defects are likely to have speech defects.

Some specific handicaps found in children are physically challenged, visual impairment, hearing impairment, speech impairment, mental retardation, socially and culturally disadvantaged children.

Visual Impairment

In the field of special education, visual impairment is the common term used to indicate any degree of vision loss. Therefore, visual impairment includes both blindness and low vision. However, both blindness and low vision are different from each other in terms of loss and functions of vision. The various terms indicate the extent of visual loss. The service delivery for the individual with visual defect is based on the assessment of the vision. Any term like legally blind or low vision, should be prescribed only after the possible corrections in the eye. Therefore, medical intervention is the first step immediately after finding out the eye problem of the individual.

Hearing Impairment

Hearing influences learning and other aspects of maturation. If a child hears imperfectly, there is every possibility that he will speak incorrectly. Auditory defects can be found in one or both ears. Sometimes children have no power of hearing at all. Some terms are used to denote auditory impairments. These are 'deaf' 'hard of hearing', 'partially deaf' and 'deaf mute'.

In defining hearing impairments, professionals with an educational orientation are concerned primarily with the extent to which the hearing loss affects the ability to speak and understand spoken language. The time of onset is therefore important.

Prelingual deafness; those who are deaf at birth or before spoken language develops are referred to as having prelingual deafness.

Post lingual deafness: those who acquire their deafness after spoken language starts to develop are referre3d to as having post lingual deafness.

Hard of hearing: those who lose their hearing after they acquire speech are known as hard of hearing.

Congenitally deaf: those who are born deaf are known as congenitally deaf.

Adventitiously deaf: those who are born with normal hearing but later lose it are called adventitious deaf 'hard of hearing' children have slight, marginal and moderate losses. They can be educated through the auditory channel.

Speech Impairment

Communication is an essential feature of interaction. Language is a must for human interaction. Many people confuse 'speech' with 'language'. When the speech of an individual differs significantly from that of others and it affects communication, it is diagnosed as speech defects. The number of children suffering from speech defects is much more than the number of those having any other impairment.

Development of speech and language depends on speech mechanism and the psychological environment the child lives in. Physical, social and psychological conditions very much affect the normal development of a

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child. These developments can affect the development of the speech and language skills of the child ultimately.

Mental Retardation

Mental Retardation is a generalized disorder appearing before adulthood, characterised by significantly impaired cognitive functioning and deficits in two or more adaptive behaviours. Mental retardation is not a disease or a medical problem. It is an educational, psychological and social problem. Mental retardation is not just confined to intellectual retardation. It may influence all aspects of human functioning including speech, language development, hearing, visual functioning and muscular coordination.

Mental illness is different from mental retardation. Mental illness refers to a psychological condition, usually characterised by the impairment of an individual's normal cognitive, emotional or behavioural functioning.

1.6.2. Gifted Children

Giftedness may be defined as demonstration of high ability, high creativity, and high task commitment. Therefore, a given child may be gifted at one time, in one area of performance, or in one situation and not in another. Giftedness is not an absolute, fixed human characteristic. Furthermore, it can be defined to include many or only very few people. Consequently, the prevalence of giftedness cannot be precisely established. Perhaps 15 to 25 percent of the population has the potential for exhibiting gifted behaviour at some time during their schooling in at least one area of performance.

Disagreement about definitions of giftedness centre on the questions of exactly how gifted children are superior; how this superiority is measured, the degree to which the individual must be superior to be considered gifted; and who should make up the comparison group. Even the terms used can be confusing. Gifted children are those whose cognitive abilities place them in the upper 3 to 5 percent of population. The gifted children have an I.Q of 130 or above. These children have superior ability, creativeness in thinking and superior talent in specific domains.

Check your Progress - 2

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

2. Mention the categories of special children.

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....

3. Who are gifted children?

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1.7. LET US SUM UP

In this unit, you have learnt about the meaning, definition and concept of special children. The term special children is a quite generic term. It refers to all those children who deviate seriously on the negative, positive and multiple sides of one or the other aspects of one's personality from the average children to the extent of requiring special measures for their adjustment, development and progress in life. Learning the concept of special children would have helped you to understand the differences between disability and handicap. This introduction unit of Special Children would have brought closer to know the concept and identification of different categories of special children so that to understand the special needs of those children.

1.8. UNIT – END EXERCISES

1. What do you understand by the term 'special children'? Differentiate disability and handicap?
2. Explain the categories of special children.

1.9. ANSWERS TO CHECK YOUR PROGRESS

1. Special children are those students who require special education and related services if they are to realise their full human potential.
2. All the special children can be classified into two broad categories as the handicapped and gifted. Again, the handicapped special children can further be classified on the basis of their specific handicaps as visually challenged, speech and hearing impaired, physically challenged, mentally retarded and socio-culturally disadvantaged children.
3. Gifted children are those whose cognitive abilities place them in the upper 3 to 5 percent of population. The gifted children have an I.Q of 130 or above. These children have superior ability, creativeness in thinking and superior talent in specific domains.

1.10. SUGGESTED READINGS

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UNIT II: PHYSICAL, VISUAL, HEARING AND SPEECH IMPAIRMENTS

STRUCTURE

2.1. INTRODUCTION

Children with special needs are those whose patterns of educational needs are very different from those of majority of children in our society. In other words, only those children, who possess deviations that require special-teaching competence or unusual school services are included. For example, there are students who have impaired vision, but they are not considered as children having special needs unless the loss is great enough to produce a need for special education service. Children who need special help are assigned with a label as visually handicapped, Deaf and hard-of-hearing, Deaf-blind, Physically and other health impaired, emotionally disturbed, Speech impaired, Learning disabled, Mentally retarded. In this unit we shall discuss the overview of the concept of physically handicapped, visually impaired, hearing impaired, types of hearing defects, and speech impaired children.

2.2. OBJECTIVES

After reading this unit, the reader shall be able to

- Know about the Physically handicapped Children.
- Know about the Visually Impaired and Hearing-Impaired Children.
- Understand the types of hearing defects.
- Know about Speech impaired children.

- Understand the types of speech defects

2.3. PHYSICALLY HANDICAPPED CHILDREN

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Physically impaired children are those children who suffer from such impairment (defects, deformities and disturbances) of their musculoskeletal and/or nervous system that may interfere with their normal functioning and adjustment to the general and specific demands of their environment (particularly restricting the activities related to locomotion or moving) and thus making them physical disabled to the extent of requiring special measures for their well-being, adjustment and educational progress.

The physiological and functional problems suffered by physical children are quite complex and diverse in nature. However, all of such impairments lead to diminish the ability and strengths of the movements and functioning of their musculoskeletal and/or nervous system particularly restricting their muscular control, muscular mobility, motor functioning and movements, etc. Causes of physical impairments may be grouped as (i) Genetic hereditary causes operating in the shape of inheritance of malformed bodies, defective psyche-structure or diseases responsible for the development of physical impairment at the later stage (ii) Causes operative in the womb of the mother leading to various types of congenital malformation and physical impairments (iii) Causes operative at the time of birth (iv) Causes lying in the poverty and lower socio-economic conditions (v) Child abuse (vi) Oxygen deprivation (vii) Accidental and Incidental factors (viii) Nutritional deficiency (ix) The effect of infections and diseases. Common physical impairments found in school age children may be broadly grouped into two types where the type one includes cerebral palsy, spina bifida and epilepsy, etc. caused by neurological conditions, in the other type we may include muscular dystrophy, poliomyelitis and arthritis, etc. caused by musculoskeletal conditions.

Cerebral palsy is the most prevalent and widely common physical impairment and locomotor disability in school age children throughout the world. It results from damage to the motor areas of the brain prior to brain maturity (i.e. before birth, during the birth process or shortly following birth). The most common types of cerebral palsy are named as spastic cerebral palsy (may make a child quite rigid with muscle tense and contracted), athetoid cerebral palsy (characterized with a constant change in their muscle tone), a toxic cerebral palsy (characterized by lack of coordination of voluntary muscles and a disturbed sense of balance and depth perception). Spina bifida represents a birth defect of the spinal column (our back bone) and is held responsible for mild to severe form of physical impairment and locomotor disabilities in the children. In addition to their birth defects, spinal cord injuries caused through any incident or accident, chronic diseases and infections may result in limited or total loss of locomotive functioning. Epilepsy or seizure disorder can be apparently caused by any kind of damage to the brain. Under the effect of this neurological condition the child may be subjected to a spontaneous abnormal discharge of electrical impulses in certain brain cells spreading to nearby cells to cause a typical disturbance of movement, sensation behaviour and/or consciousness. The most common types of epilepsy. are known as psychomotor seizure, petitmal seizure and grandmal seizure.

Head injuries also lead to such serious neurological conditions that may result into one or the other form of physical impairments and locomotor dis-abilities to many of the children. Multiple sclerosis (an incurable progressive disease of the central nervous system) which result into the distraction of the insulating material covering nerve fibres is also known as to cause serious locomotor disabilities in the children after 9 or 10 years of age.

Among the group of physical impairments caused by musculoskeletal conditions, the muscular dystrophy represents a group of inherited diseases in which the muscles of the body are subjected to the condition of progressive atrophy (weakening and wasting away of muscular tissue) resulting into so many serious physical impairment and locomotive disabilities in the affected children. Three types namely pseudo hypertrophic, Facioscapulohumeral and Juvenile dystrophy are most common in school going children. Poliomyelitis, popularly known as polio is an acute communicable disease may result into partial or complete paralysis and gross deformities of the total body system making a child physical impaired and disabled in so many ways. Arthritis is defined as pain in and around the joints, usually reducing range of motion and causing weakness. One type of this affecting the Juvenile is referred to as Juvenile Rheumatoid

Arthritis the most severe form may require hospital and home bound treatment and educational measures. Other less common type of physical impairments resulting from the musculoskeletal conditions may be known as osteogenesis imperfecta (characterized by improper formation of bones and their easy breaking), Osteomyelitis (caused by the bacterial infection of the child's bone), Legg-calve-Perthes disease (flattening of the head of the femur or hip bone), clubfoot (turning out of one or both feet at the wrong angle at the ankle), limb deficiencies (loss of one or more limbs), scoliosis (an abnormal lateral curvature of the spine) and achondroplasia (resulting into straight upper back and curved lower back), etc.

Preventive measures for physical impairment may include the measures like avoidance of consanguineous marriages, timely care of new-born infants and children in terms of providing preventive vaccine like polio dose, proper health and hygiene care of the children for avoiding contamination, infection and virus diseases causing physical impairments, possible preventive measures for avoiding road accidents and avoidance of delay in providing necessary first aid, proper care of mother during pregnancy and at the time of delivery for avoiding congenital malformations, etc.

Efforts for the education and adjustment of the physically impaired children can go well along with the normal children in the normal educational set-up with a little extra cautious and needed physical arrangements. For their proper integration, it is always better to adopt team approach calling for the joint efforts of medical professionals, physical therapists, occupational therapists, guidance and counselling personals, social workers, parents and school personnel. In addition, valuable efforts should also be made in developing suitable enriched programmes aiming to enhance their mastery over the daily living skills, communication and social skills, academic growth and personality development and life skills training for acquiring economic independence. For the implementation of these

enriched programmes, earnest efforts should always be made in bringing proper modification and adaptations in the regular school set-up (instructional adaptation and adaptations in terms of physical and material facilities) according to the educational and adjustment needs of the physical impaired children.

In addition to making provisions for the education and bringing modification in the school environment, school authorities should work hand in hand with parents, government and non-governmental organizations for managing suitable treatment and welfare measures for the physical impaired children. Their impairments may either get cured with the help of suitable medical facilities and treatments or they may be helped to adjust and live comfortably with the assistance of suitable assistive aids and therapies.

2.4. VISUALLY IMPAIRED CHILDREN

There are two most common ways of describing visual impairment. They are the legal and educational definitions. The former one is used by the lay people and the practitioners in the medical profession; the latter is favoured by the educators.

A legally blind person is one who has visual acuity of 20/200 or less in the better eye even with correction (e.g., eyeglasses) or has a field of vision so narrow that its widest diameter subtends an angular distance no greater than 20 degrees. the fraction 20/200 means that the person can see at 20 feet what a person with normal vision can see at 200 feet. In addition to this medical classification of blindness, there is also a category referred to as partially sighted. According to the legal classification system, partially sighted individuals have visual acuity falling between 20/70 and 20/200 in the better eye with correction.

Many professionals, particularly educators, have found the legal classification scheme inadequate. They are of the opinion that visual acuity is not very accurate predictor of how people will function or use whatever remaining sight they possess. According to educational definition blind individuals are those who are so visually impaired that they must learn to read Braille or use aural methods. Educators often refer to those visually impaired individuals even if they need magnifying devices or large-print books, as having low vision.

Most of the visual problem is the result of errors of refraction. Because of faulty structure and/or malfunction of the eye, the light rays do not focus on the retina. The most common visual impairments are myopia (near-sightedness) hyperopia (farsightedness), and astigation (blurred vision). Eyeglasses or contact lenses can usually correct these problems. Most serious visual impairments in school stage students are due to hereditary factors. Blindness is also caused by certain environmental as well as genetic agents. These etiological agents include infections, diseases, accidents, poisoning, tumours and cancer.

Visual impairment may result in a few subtle language differences but not in deficient language skills. Blindness does not result in intellectual retardation. Visually impaired children rely more on touch than on vision to learn about their world. So, there are some differences in conceptual development. Sight facilitates better perception of objects or parts of an object simultaneously whereas touch results in successive perceptions of

most objects and requires more conscious effort. Early training in use of strategies helps children use their touch more efficiently.

Personality problems are not an inherent condition of visual impairment. Any social adjustment problems of blind individuals are primarily the result of society's reaction to the blind. The stereotypes (e.g. Repetitive rocking) exhibited by a few blind individuals can be an impediment to social acceptance, but behavioural techniques can diminish their occurrence.

Educational experiences in regular classrooms are frequently visual. But with some modifications in methods, teachers can apply the same general principles of instruction to both sighted and visually impaired students. Braille may be useful for those whose vision is so impaired that they cannot read even large type. More and more blind individuals are turning to audiotapes for their reading medium. The compressed speech method, in particular, permits fast and efficient presentation of material. Also, there are a number of technological devices being developed for the visually impaired population. Some of them are optacon, the Kurzweil Reading Machine and taking calculators.

Most scientists believe that the most important ability for successful adjustment of visually impaired people is mobility. Mobility training can involve the use of human guides, guide dogs, the long cane, and electronic devices such as the Sonic guide. Most mobility instructors recommend the long cane for the majority of blind people.

The four basic educational placements for visually impaired children are the residential school, special class, resource room, and itinerant teacher. More and more visually impaired students are in general education classrooms. Residential placement, at one time the most popular alternative, is now recommended infrequently. Current trend is for integrating programming between residential and community-based facilities. Education for the adolescent and adult stresses independent living and employment skills. Independence is extremely difficult to achieve for some visually impaired people, but it is extremely important, especially for work adjustment, for them to be able to function independently. A contributing factor to dependency is society, which often mistakenly views visually impaired people as helpless.

Only about one third of working-age blind adults are employed, and they are frequently overqualified for their jobs. Professionals are now attempting to change this bleak employment picture with innovative approaches such as job training in regular work settings rather than simulated setting in classrooms.

Check your Progress - 1

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

1. Who are physically handicapped?

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2. List the most common visual impairments

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2.5. HEARING IMPAIRED CHILDREN

Hearing influences learning and other aspects of maturation. If a child hears imperfectly, there is every possibility that he will speak incorrectly. Auditory defects can be found in one or both ears. Sometimes children have no power of hearing at all. Some terms are used to denote auditory impairments. These are 'deaf' 'hard of hearing', 'partially deaf' and 'deaf mute'.

In defining hearing impairments, professionals with an educational orientation are concerned primarily with the extent to which the hearing loss affects the ability to speak and understand spoken language. The time of onset is therefore important.

Prelingual deafness*:* those who are deaf at birth or before spoken language develops are referred to as having prelingual deafness.

Post lingual deafness: those who acquire their deafness after spoken language starts to develop are referred to as having post lingual deafness.

Hard of hearing: those who lose their hearing after they acquire speech are known as hard of hearing.

Congenitally deaf: those who are born deaf are known as congenitally deaf.

Adventitiously deaf: those who are born with normal hearing but later lose it are called adventitious deaf 'hard of hearing' children have slight, marginal and moderate losses. They can be educated through the auditory channel.

2.6. TYPES OF HEARING DEFECTS

The hearing-impaired children can be subdivided according to the organic hearing loss. These are as follows:

2.6.1. Conductive Hearing Loss

Conductive losses are impairments that interfere with transferral of sound along the conductive pathway. This is the most common

hearing impairment among children. In this case there is reduction in the loudness of sound so that its clarity is distorted. This often results from pathological changes in the middle ear due to congenital or acquired defects of the ear. If it is mild, then a surgical or medical remedy is possible. Proper and timely treatment of acute infections in the middle ear and the prevention of chronic infections of the ear will often greatly reduce incidence of hearing defects. Hearing aids and sound amplification systems are also conductive to mitigate conductive defects.

2.6.2. Sensorineural Hearing Loss

Sensorineural problems are confined to the complex inner and are apt to be much harder to treat. The most common causes of inner ear troubles are linked to hereditary factors. Acquired hearing losses of the inner ear include those due to bacterial infections such as meningitis, viral infections, such as mumps and measles, prenatal infections of the mother such as cytomegalovirus maternal rubella, and syphilis, and deprivation of oxygen at birth. Here, the sound is conducted without any difficulty, properly, hearing aids, auditory training, lip-reading and language training can help children having moderate defects. However, special schooling is needed for children with profound hearing impairments.

2.6.3. Psychogenic Hearing Loss

Here, the cause of the difficulty is purely psychological. Very often, there is a history of ear infection, which appears to act as a shock organ for localisation of the psychic symptom. Sometimes, under a stressful situation the child may unconsciously develop hearing loss as an escape from what according to him is an intolerable situation. It is very difficult to distinguish between organic defects and psychogenic losses. Appropriate audiological techniques and meticulous observation can often help to bring out a correct diagnosis.

2.6.4. Central Auditory Defects

These defects are extremely complex. Their causes and pathogenesis are not known. Children having this defect are aware of sound but they are unable to get its meaning. These defects cause severe communication problems. During early infancy, use of certain lifesaving drugs can also affect auditory system. Such children require an extensive and prolonged therapy because they are difficult to manage.

Hearing impaired pupils can be found in a variety of settings, ranging from general education classrooms to residential settings. Mainstreaming of hearing-impaired students is growing in popularity; but only about 20 percent of hearing-impaired students are placed primarily in regular classrooms. A growing minority believes that mainstreaming is not appropriate for deaf students. The language problems exhibited by many learning-disabled students is major deterrent to widespread integration into general education classrooms.

2.7. SPEECH IMPAIRED CHILDREN

Communication is an essential feature of interaction. Language is a must for human interaction. Many people confuse 'speech' with 'language'. When the speech of an individual differs significantly from that of others and it affects communication, it is diagnosed as speech defects. The number of children suffering from speech defects is much more than the number of those having any other impairment.

Development of speech and language depends on speech mechanism and the psychological environment the child lives in. Physical, social and psychological conditions very much affect the normal development of a child. These developments can affect the development of the speech and language skills of the child ultimately.

2.8. TYPES OF SPEECH DEFECTS

The classification of speech defects is based on purpose of classification. Speech defects may be classified according to such major symptoms as articulation disorders, voice disorders, delayed speech, stammering and disturbances of rhythm, these can also be classified on the basis of cause according to which it may be organic or functional. But this dichotomy does not hold good for various reasons. Now we shall discuss some of the major speech defects in detail.

2.8.1. Disorders of Articulation

This type of disorder includes various symptoms such as distortion, omission, addition or substitution of speech sounds. Very often it includes mispronunciation of an entire word or words. These defects are commonly found among children. According to statistics, 70 to 80 percent of speech defects are of this kind. In young children, this defect manifests as immature speech. However, it is possible to circumvent this deficiency.

2.8.2. Disorders of Voice (Phonation)

This type of disorder is found more often in adults than in children. It includes marked deviations in terms of loudness, quality, pitch or intensity of nasality and hoarseness are also found. The causes may be emotional, vocal abuse, overuse or infections. Tension and shocks in life are also contributory factors.

2.8.3. Delayed Speech

Among children, the frequency of delayed speech is much higher than any other defects in communication. The chief causes of delayed speech are hearing loss, mental retardation, cerebral dysfunction, emotional disturbances and environmental deprivation. Very often, children are not able to speak at the usual age due to lack of motivation. Professional help should be sought for the treatment and diagnosis of delayed speech.

2.8.4. Stuttering and Stammering

Stuttering is a type of repetitive speech. Very often stuttering is confused with stammering. These are most serious forms of speech disorders. They are chiefly caused by emotional difficulties, fear of failure, fear of authority, anxiety, frustration, insecurity, hostility, overprotection by adults, etc. ridiculing the children will aggravate the situation.

While stuttering is often considered a disorder of rhythm, stammering is marked by a difficulty in producing any speech sound. In both the cases the affected children need to be treated by a specialist. There are two approaches for the treatment of stammering i.e. symptomatic treatment and psychotherapy.

Check your Progress - 2

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

3. State the types of hearing defects.

....

4. What do you mean by stuttering and stammering.

....

2.9. LET US SUM UP

Special children are those children who deviate significantly from the normal ones. A special child is so exceptionally inferior or superior to the normal children in terms of physical development, mental ability, social behaviour and emotional reactions he/she experiences a sort of mall adjustment in life and faces difficulties in making a successful achievement in people and situations. Such a child needs special care and education for his proper adjustment and maximum utilisation of his/her abilities. In this unit you have learnt about the nature of physically handicapped, visually impaired, hearing impaired and speech impaired children.

2.10. UNIT – END EXERCISES

1. Explain the concept of Visual impairment.
2. Describe the types of speech defects.

2.11. ANSWERS TO CHECK YOUR PROGRESS

1. Physically impaired children are those children who suffer from such impairment (defects, deformities and disturbances) of their musculoskeletal and/or nervous system that may interfere with their normal functioning and adjustment to the general and specific demands of their environment (particularly restricting the activities related to locomotion or moving) and thus making them physical

disabled to the extent of requiring special measures for their well-being, adjustment and educational progress.

2. Total blind, partially sighted
3. Conductive hearing loss, sensorineural hearing loss, psychogenic and central auditory defects.
4. Stuttering is a type of repetitive speech.
5. While stuttering is often considered a disorder of rhythm, stammering is marked by a difficulty in producing any speech sound.

2.12. SUGGESTED READINGS

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UNIT III: MENTALLY RETARDED AND GIFTED CHILDREN

STRUCTURE

3.1. INTRODUCTION

The special children deviate from the normal children either in positive direction or in the negative direction. The society's response towards these children has not always been the same. The attitude and response of the society towards the less fortunate children have changed over the years from rejection and exclusion to integration and inclusion. Children with severe disabilities are excluded from the main stream of the regular school. Only mildly and moderately disabled children are integrated in the regular classrooms. This unit outlines an overview of mentally retarded, gifted and talented, culturally disadvantaged and socially disadvantaged children. The learners will get an idea about the needs of these children and education for them.

3.2. OBJECTIVES

After reading this unit, the reader shall be able to

- Define the Mentally Retarded Children.
- Define the Gifted and talented children.

- Define the Socially disadvantaged children and their needs and education.

3.3. MENTALLY RETARDED CHILDREN

Generally, mental retardation is regarded as a disease in earlier days. In the past, the mentally retarded children were neglected by the society as they were thought to be possessed by spirits. Now a day, there is greater acceptance of and awareness about mentally retarded children among the general public.

Mental Retardation is a generalized disorder appearing before adulthood, characterised by significantly impaired cognitive functioning and deficits in two or more adaptive behaviours. Mental retardation is not a disease or a medical problem. It is an educational, psychological and social problem. Mental retardation is not just confined to intellectual retardation. It may influence all aspects of human functioning including speech, language development, hearing, visual functioning and muscular coordination.

Mental illness is different from mental retardation. Mental illness refers to a psychological condition, usually characterised by the impairment of an individual's normal cognitive, emotional or behavioural functioning.

The first standard definition of mental retardation was proposed by Hebber (1962) taking intelligence, adaptive behaviour and developmental level into consideration. Then a more adequate definition was developed by the American Association of Mental Deficiency (AAMD) in 1973. It states; "Mental retardation refers to significantly sub-average general intellectual functioning existing concurrently with deficits in adaptive behaviour and manifested during developmental period". This developmental period includes the life span from birth to 18 years of age.

3.3.1. AAMD Classification of Mental Retardation

The most commonly accepted approach to classification is to consider retarded children according to degree of severity. AAMD classifies mental retardation as mild, moderate, custodial mentally retarded. These terms help minimise negative stereotyping. Some educators also use the classifications educable, trainable and severely and profoundly retarded.

3.3.2. Clinical Classification of Mental Retardation

Taking I.Q. into consideration, the following classification has been made by psychologists.

Level of Mental Retardation	Wechsler IQ	Stanford Binet IQ
Mild	(55-69)	(52-67
Moderate	40-54	36-51
Severe	25-30	20-35
Profound	Under 25	Under 20

NOTES

Clinical evidences indicate that on an average 2.5 percent of children in India are mild to moderately retarded and 0.5 percent severely retarded.

3.3.3. Causes of Mental Retardation

A variety of factors can cause mental retardation most people with mild retardation are considered culturally – familial retarded. Environment and / or heredity factors are the main causes of mild retardation. We can categorise causes of moderately to severely retarded individuals as due to genetic factor or brain damage. Down syndrome, PKU, and Tay-Sachs disease are all examples of genetic causes. Brain damage can be the result of infectious diseases such as meningitis, encephalitis, rubella and paediatric AIDS. Premature birth can also result in mental retardation.

3.3.4. Educational Problems of Mentally Retarded

Individuals with mental retardation have learning problems related to attention memory language and academics. In metacognition they lack depth of processing and executive control. Depth of processing refers to how much cognitive activity a person has to undergo to perform a task. Mentally retarded individuals process information at a shallower level than non-retarded people. Executive control refers to the ability in planning, monitoring, and evaluating one's own performance. Individuals with retardation have problems with executive control processes. In addition to cognitive problems, mentally retarded children often have behavioural and personality problems, which also aggravate learning problems.

3.3.5. Education for Mentally Retarded

Educational goals for mildly and moderately retarded students are quite similar. At younger ages there is an emphasis on readiness skills, and at older ages. There is more emphasis on functional academics and vocational training. Functional academics are academics for the purpose of enabling the person to function independently. Educational programmes for severely and profoundly retarded students are characterised by

1. Age appropriate curriculum and materials
2. Functional activities
3. Community – based instruction
4. Therapy
5. Interaction with non-disabled students
6. Integrated family environment.

Check your Progress - 1

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

1. What is meant by mental retardation

....

2. Give the clinical and educational classification of mentally retarded

....

Applied behavioural analysis is often the method of choice for teachers working with retarded students.

3.4. GIFTED CHILDREN

Disagreement about definitions of giftedness centre on the questions of exactly how gifted children are superior; how this superiority is measured, the degree to which the individual must be superior to be considered gifted; and who should make up the comparison group. Even the terms used can be confusing. Gifted children are those whose cognitive abilities place them in the upper 3 to 5 percent of population. The gifted children have an I.Q of 130 or above. These children have superior ability, creativeness in thinking and superior talent in specific domains.

Giftedness may be defined as demonstration of high ability, high creativity, and high task commitment. Therefore, a given child may be gifted at one time, in one area of performance, or in one situation and not in another. Giftedness is not an absolute, fixed human characteristic. Furthermore, it can be defined to include many or only very few people. Consequently, the prevalence of giftedness cannot be precisely established. Perhaps 15 to 25 percent of the population has the potential for exhibiting gifted behaviour at some time during their schooling in at least one area of performance.

3.4.1. Factors Promoting Giftedness

Genetic factors are known to contribute significantly to behavioural development, including intelligence and gifted performance. Environmental factors-families; schools and communities are also known to influence the development of giftedness. Giftedness, then, is a result of combined biological and environmental influences nature and nurture. Current research suggests that one's collection of genes sets limits of performance; the actual performance within those limits is determined by environmental factors.

3.4.2. Attitude Towards Gifted Children and Their Education

In recent years interest in education of gifted children has increased, but most gifted students do not receive any special services appropriate to their abilities. As a result, some of the gifted students become under achievers those who fail to achieve at a level consistent with their abilities, whatever the reason. Under achievement is often a problem of minority students, whose special abilities tend to be overlooked because of biased expectations and / or the values of majority.

Generally gifted children, when allowed to attend regular classes, face a lot of problems of their own. An average class and its programmes are planned for children of average ability. By admitting gifted children into their class. They are denied the opportunity; they need for full development of their talents. Their education is restricted. The teacher finds himself placed in a very awkward position as to how to satisfy both the talented and the average children.

Giving double promotion is no solution. When the gifted child is given an accelerated promotion, he is placed out of his own group study, special classes and special. schools. Acceleration has not been popular plan for educating gifted students, although considerable research supports it. A major issue is acceleration versus enrichment. Programmes of acceleration especially in mathematics, in which students skip grades or complete college level work easily have been evaluated positively. Models of enrichment include a revolving door plan in which students continue to engage in enrichment activities for as long as they are able to go beyond the usual. curriculum of their age makes and a school wide enrichment model that is designed to improve the learning environment for all students. Although the gifted students do not face any problem in their transitions to adolescence, adulthood, and higher education and employment, many of them do need personal and career counselling and guidance in making contacts with school and community resources.

Check your Progress - 2

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

3. What is the I.Q. level of Gifted children

....

4. Mention the factors promoting giftedness.

....

3.5. SOCIALLY DISADVANTAGED CHILDREN

Deprivation, in ecological terms, consists of two-tier concentric layer

(i) The upper and more visible layer contains home; school, peer group etc., each providing three dimensions: Physical space and materials, social roles and relationships and activities, and

(ii) The supporting or the surrounding layer is provided by geographic and physical environment and the institutional setting of the general services and amenities. Of course, this scheme provides a better conceptualisation of various kinds of deprivation.

Again, cultural deprivation refers to a complex set of condition, which create intellectual's deficiency in a child. These conditions include unstimulated environment, lack of verbal interaction with adults, poor sensory experience and other deleterious environmental factors associated with poverty.

3.5.1. Characteristics of Socially Disadvantaged Children

The socially disadvantaged children are marked by the following three general characteristics during their school years. They are:

1. Progressive decline in intellectual functioning
2. Cumulative academic achievement deficits
3. Premature school termination or higher dropout rate

3.5.2. Causes of Low Achievement

Research evidences reveal that high caste and scheduled caste students differ significantly in academic achievement. The lower achievement of the socially disadvantaged children can be ascribed to at least five causes such as:

i) Malnutrition
ii) Genetic factors
iii) Lack of stimulating early experience
iv) Social motivations, and
v) Cultural values

However, the cognitive style or strategy adopted by a group also can account for the lower performance of the disadvantaged children.

3.6. EDUCATION FOR SOCIALLY DISADVANTAGED CHILDREN

Educational provisions have been made for the socially disadvantaged children by the government. In the area of intellectual and social competence, enrichment programmes are designed to develop and enlarge children's conceptual repertoire and communicative skills. Some important measures are discussed below.

3.6.1. Establishment of Residential Schools

Appropriate steps should be taken to establish residential schools and Ashram schools for disadvantaged students like SC and ST students. Of course, residential schools should be made to suit the needs of Adivasis. Measures should be taken to make these institutions more homely.

3.6.2. Financial Help

Poverty is a pertinent factor, which serves as a barrier in the path of progress of socially disadvantaged children. Both central and state governments have been giving financial aid to these students since long in the form of pre-matric and post-matric scholarships. They are exempted from paying admission and tuition fees also.

3.6.3. Appointment of Expert Teachers

Teachers who specialise in tribal dialect should be appointed. Residential; accommodation' must be provided to teaching experts and administrators who work in hilly and tribal areas. Inservice training programmes and refresher courses should be conducted periodically

3.6.4. Craft Education

Useful crafts like carpentry, weaving and tailoring must be introduced to, suit the needs of SC and ST students, which are indispensable for their economic development. According to educational statistics, craft education is compulsory in some states and union territories.

3.6.5. Adjustment of School Hours and Vocations

There must be an adjustment of school vocations and school hours for these students so that they can meet the socio-economic needs of the community. The percentage of dropouts and stagnation can be diminished to a considerable extent if school hours -and vocations can be properly adjusted. Also, these students will get -ample opportunity to assist their parents.

The above discussed points must be carefully considered and absorbed into the educational strategy for the education of the socially disadvantaged children, so that they will not become victims of cumulative deprivation.

Check your Progress - 3

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

5. Give the characteristics of socially disadvantaged children

....

....

3.7. EDUCATION AND CULTURAL DIVERSITY

India is a land known for, diverse people and diverse. culture. Paradoxically, another strength has been the melding of this diversity into a single, uniquely Indian identity. To understand the implications of cultural diversity for special education, we must first consider the definition of culture and how it is related to the educational needs of children.

Culture is consisting primarily of the symbolic, ideational, and intangible aspects of human societies. Culture includes values and behavioural styles, languages and dialects, non-verbal communication, awareness of one's own cultural distinctiveness, frames of reference, and identification. These elements together make up a national or .shared culture, which is referred to as macro culture. Within a national macro culture are found many micro cultures such as ethnic, social, gender, religions, exceptionality and other groups. A person may belong to a variety of micro cultures that affect his or her behaviour.

The general purpose of multicultural education is to promote understanding of micro cultures and foster positive attitudes towards cultural diversity. Ethnic and exceptionality groups are particularly important micro

cultures in special education. Multicultural education should ensure that ethnicity and exceptionality are not confused. It should also promote understanding of the micro culture of exceptionality and its relationship to other micro cultures. Educators should design activities to reduce prejudice and stereotyping of multicultural groups other than one's own.

Authorities now recognise the importance of acknowledging students' cultural styles while providing effective instruction in the skills that will enable them to be successful in the dominant culture. Socialisation involves helping students become comfortable with their identification with micro cultural groups avoid destructive and stereotypic social perceptions and interactions, and becomes advocates for themselves and other members of their micro cultures. Teachers must become comfortable with their own micro cultural identification and provide classroom activities that encourage understanding.

3.8. LET US SUM UP

In this unit you have learnt about mentally retarded children, how they are classified, causes, educational problems of mentally retarded children. You have come to know about the educational provisions for mentally retarded children. You will be able to identify gifted children and develop positive attitude towards them. This unit facilitated you to understand the characteristics and suitable education for socially and culturally disadvantaged children.

3.9. UNIT – END EXERCISES

1. List out the major causes of mental retardation
2. Discuss the problems in imparting education to mentally retarded children and suggest the appropriate educational measures.
3. What is your attitude towards gifted children?
4. What are the causes of low achievement among socially disadvantaged children?
5. Enumerate the educational provisions for socially disadvantaged children.

3.10. ANSWERS TO CHECK YOUR PROGRESS

1. Mental retardation refers to significantly sub-average general intellectual functioning existing concurrently with deficits in adaptive behaviour and manifested during developmental period
2. Clinical classification – Mild, moderate, severe and profound. Educational classification – Educable, trainable and custodial.
3. IQ level of gifted children is 130 or above
4. Factors promoting giftedness – genetic factors (intelligence, behaviour and development), environmental factors (family, schools and communities)
5. Progressive decline in intellectual functioning, Cumulative academic achievement deficits, Premature school termination or higher dropout rate.

3.11. SUGGESTED READINGS

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UNIT IV: VISUALLY HANDICAPPED CHILDREN

STRUCTURE

4.1. INTRODUCTION

The vision is a complex sense, good vision depends on the intactness and efficiency of the intricate psychological system. Trouble in any part of this system leads to visual impairment. Not all of the visually challenged have physical stigma in or near their eyes. They do have in common some type of limitation in the use of vision for the ordinary tasks of life. In order to understand some of the common visual problems, a brief and simple review of some facts about the eye and vision will be useful. This unit deals with visually impaired children. The readers would come to know about the categories and characteristics of visually challenged children. It also provides practical guidelines to practitioners to teach visually impaired children.

4.2. OBJECTIVES

After reading this unit, the readers shall be able to

1. Define visual impairment according to legal or medical consideration and educational consideration.
2. Understand the causes and categories of visual impairment.
3. Know the characteristics of visually impaired children
4. Identify visually impaired children in order to make appropriate assessment and placement.

4.3.VISUALLY HANDICAPPED/IMPAIRED CHILDREN

Like anyone with a disability, the blind person wants to be treated like everyone else. Most blind people do not seek pity or even unnecessary help. Although they may need assistance in some situations, mostly they prefer to be reminded of their similarities rather than differences,

4.3.1. Definition of Visual Impairment

There are two ways of describing visual impairment. One is legal definition and the other is educational definition. The former one is used by lay people and those in the medical profession; the latter is used by the educators.

4.3.2. Legal Definition

The legal definition is based on assessment of visual acuity and field of vision. A person is said to be legally blind if he has visual acuity of 20/200 or less in the better eye even with correction or has a field of vision so narrow that its widest diameter subtends an angular distance no greater than 20 degrees. The fraction of 20/200 means that the person sees at 20 feet what a person with normal vision sees at 200 feet. Normal vision acuity is thus 20/20.

There is also another category referred to as partially sighted. According to the legal classification system, partially sighted individuals are those who have visual acuity falling between 20/70 and 20/200 in the better eye with correction (e.g., eyeglasses)

4.3.3. Educational Definition

Most professionals especially educators have found the legal classification system inadequate. According to them visual acuity is not a very accurate predictor of how people will function or use whatever remaining sight they have. It is to be noted that only a small percentage of legally blind people have absolutely no vision, but the vast majority are able to see. According to research evidences only 18 percent of legally blind students are totally blind whereas most individuals classified as legally blind can see well enough to read large or regular print books.

The limitations of legal definition of blindness and partial sightedness led the educators to evolve their own definition. Educational definition is based on the method of reading instruction. For educational purpose, blind people are those individuals whose vision is so severely impaired that they must learn to read Braille or use aural methods such as audiotapes and records. (Braille is a system of raised dots by which blind people "read" with their fingertips and it consists of quadrangular cells containing from one to six dots whose arrangement denotes different letters and symbols.) Those visually impaired individuals who can read print, even if they need magnifying devices or large print books, are referred to as having low vision.

4.3.4. Causes of Visual Impairment

There are various causes of visual impairment. They are:

i) Errors of refraction
ii) Glaucoma, Cataracts and diabetes
iii) Prenatal causes
iv) Improper muscle functioning

i) Errors of Refraction

The most common visual problems are the result of errors of refraction. Myopia (near sightedness), hyperopia (far sightedness), and astigmatism (Blurred vision) are all examples of refraction errors that affect central visual acuity. Each of these can be serious enough to cause significant impairment. Myopia and hyperopia are the most common impairments of low vision. In these cases, glasses or contact lenses can bring vision within normal limits.

When the eyeball is too long, the light rays from the object would be in focus in front of rather than on the retina. This results in myopia, which affects vision for distant objects, but close vision may be unaffected. When the eyeball is too short the light rays from the object would be in focus behind rather than on the retina. This results in hyperopia, which affects vision for close objects, but far vision may be unaffected. When the cornea or lens of the eye is irregular, the light rays from the object would be blurred or distorted. This results in astigmatism (blurred vision).

ii) Glaucoma, Cataract, and Diabetic Retinopathy

Glaucoma, cataract and diabetes cause more serious impairments. These occur primarily in adults, but each of them, particularly the latter two can occur in children also.

Glaucoma is a condition in which there is excessive pressure in the eyeball. Left untreated, the condition progresses to the point at which the blood supply to the optic nerve is cut off and blindness results. The cause of glaucoma is presently. Unknown and its onset can be sudden or very gradual. A common complaint during early stages of glaucoma is that lights appear to have halos around them.

Cataracts are caused by a clouding of 'lens of the eye which results in blurred vision. In children the condition is called congenital cataracts. It affects distance and colour vision seriously. Surgery can usually correct the problems caused by cataracts.

Diabetic retinopathy is caused by diabetes. When there is interference with the blood supply to the retina this condition occurs.

iii) Prenatal causes

There are several other visual impairments that primarily affect children. Visual impairments of school-age children are often due to prenatal causes, many of which are hereditary. Like congenital cataracts and glaucoma, there are other congenital conditions.

Coloboma, another congenital condition, is a degenerative disease in which the central and/or peripheral areas of the retina are not completely formed. This results in impairment of the visual field and/or central visual acuity.

Retinitis Pigmentosa is yet another prenatal condition. It is a hereditary disease resulting in degeneration of retina. Retinitis pigmentosa causes the person's field of vision to narrow.

Also included in the prenatal category are infectious diseases that affect the unborn child, such as syphilis and rubella.

iv) Improper Muscle Functioning

Improper muscle functioning causes two other conditions, which result in visual problems. Strabismus vis a -condition in which the eye/s is/are directed inward (crossed eyes) or outward. If it is left untreated, strabismus will result in permanent blindness because the brain will eventually reject signals from a deviating eye. Fortunately, most cases of strabismus can be corrected with eye exercises or surgery. Nystagmus is a condition in which there are rapid involuntary movements of the eyes. This results in dizziness and nausea. Nystagmus is sometimes a sign of brain malfunctioning and / or inner ear problems.

Check your Progress - 1

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

1. Define Visual impairment.

....

2. What are the causes of visual impairment?

....

4.4. CHARACTERISTICS OF VISUALLY IMPAIRED CHILDREN

The most important characteristic of the visually impaired child is that like all other children, he/she is an important and valuable human being. Persons involved in the training programme of the visually impaired children is more concerned about physical, mental, social and emotional characteristics of visually impaired children. Some of the general characteristics of visually impaired are

4.4.1. Intellectual and Educational Characteristics:

There is difference of opinion in respect of intellectual and educational characteristics of the visually impaired children. According to Villey "no mental faculty of the blind is affected in any way, and all of them, under favourable circumstances are susceptible of blossoming out to the highest degree of development to which a normal being can aspire". In the words of Conversely, Cutsforth, "No single mental activity of the congenitally blind child is distorted by the absence of sight". These two statements represent diametric extremes of opinion on the topic. The truth no doubt lies somewhere between these two positions.

4.4.2. Emotional and Social Characteristics:

So far, no reliable and authentic views have been expressed by the authorities in respect of the emotional and social characteristics of the visually impaired children. A recent study states (l) Social and emotional maladjustment or both as typically defined and measured are not necessary consequences of limitations in vision. (2) Such maladjustment which does occur is not directly proportional in severity to nor necessarily directly related to, visual limitation. (3) Negative attitudes towards visually limited individuals and negative self-regarding attitudes by the visually limited are found frequently and may produce a disproportionate amount of social and emotional maladjustment by comparison with that found among the normally seeing.

There are some psychological and behavioural characteristics pertaining to visually impaired children. These characteristics are discussed below.

i) Restricted language Development

Many authorities believe that lack of vision does not alter very significantly the ability to understand and use language. However, there are a few subtle differences in the way in which language usually develops in visually impaired children compared to sighted children. Blind children's early language tends to be somewhat restricted by their back of visual experiences. Sighted children use language more readily to refer to activities involving other people and objectives whereas visually impaired children's language tends to be most self-centred. It warrants as rich an exposure as possible at as young an age as possible for visually impaired children.

ii) Lag in conceptual Development

Visually impaired children lag behind their sighted peers in conceptual development. There are some important differences between blind and sighted individuals' conceptual development most of which are due to the difference between tactual and visual experiences.

iii) Tactual Perception

The tactual sense is primarily how the blind child acquires a variety of concepts that the sighted child usually acquires through the visual sense. There are two kinds of tactual perceptions. They are synthetic touch and analytic touch.

Synthetic touch refers to a person's tactual exploration of objects small enough to be enclosed by one or both hands. Most physical objects are too large for synthetic touch to be useful.

Analytic touch involves touching of various parts of an object and then mentally constructing these separate parts. The sighted person is able to perceive different objects of the parts of one object simultaneously whereas the blind person must perceive things successively. Blind people are at a distinct disadvantage because they are unable to use sight to help them develop integrated concepts.

iv) Obstacle Sense

A large part of blind person's skill in mobility is the ability to detect physical obstructions in the environment. A blind person walking along the street often seems to be able to "sense" an object in his or her path. This ability has come to be known as obstacle sense. Many lay people and some professionals have taken it to mean that blind people somehow develop an extra sense, but this is not true. Although the obstacle sense is important for mobility of a blind person, it cannot by itself make its user a highly proficient traveller. It is just an aid. Also, it requires walking at a fairly slow speed to be able to react in time.

v) Difficulty in Social Skills

It is society's reaction to the blind persons that determines their social adjustment or lack of it. Visually impaired children are not accepted by nondisabled persons because some of them experience difficulty in attaining certain social skills, such as exhibiting appropriate facial expressions. Teaching social skills to visually impaired children will be a very challenging task because such skills are traditionally acquired through modelling and feedback using sight.

vi) Stereotypic Behaviours

An impediment to good social adjustment for a few visually impaired individuals is stereotypic behaviours or stereotypic. These are repetitive, stereotyped movements such as rocking or rubbing the eyes. Stereotypic behaviours are caused by sensory deprivation, social deprivation and retreat to familiar patterns of behaviour under stress.

4.5. CATEGORIES OF VISUALLY IMPAIRED CHILDREN

From the definitions given in the beginning section of this chapter one can understand that there are two categories of visually impaired children. They are

i) Totally blind children
ii) Children having low vision

i) Totally Blind Children

Totally blind-children are those who are born without ability to see or they must have gone blind by accident operations etc. According to legal medical consideration, children who have visual acuity of.20/200 or less in the better eye even with correction (e.g., eyeglasses) are known-as totally blind children. 'According to educators, those children whose visions are so severely impaired that they must learn to read Braille or use aural methods are known as totally blind children. Total blindness can be recognised easily and identified early, but a detailed examination is needed to identify children having low vision.

ii) Children Having Low Vision

According to medical consideration, this category children are referred to as partially sighted children. They have visual acuity falling between 20/70 and.20/200 tin the better eye with correction. According to educators those visually impaired children who can read print, even if they need magnifying devices or large-print books, are referred to as children having low vision. The detection of low vision is a much more difficult, proposition. Such children have little concept of "vision". As such it is difficult for them to report about their visual problems.

4.6. PROBLEMS OF VISUALLY IMPAIRED CHILDREN

The visually impaired children experience many problems like behaviour problems, problems of learning, problems of their placement in society or problems of social adjustment. Some of these problems are discussed below.

i) Poor intelligence

Research evidences reveal that visually impaired children have a poor lQ. These researchers state that since the visually impaired children have considerable difficulties in the exploration of their environments, they have impairments in concept formation. It results in their poor performance in intelligence tests. On the contrary, recent western studies indicate that there is no reason to believe that blindness results in lower intelligence.

ii) **Academic Retardation**

Visually impaired children have poor academic achievements even if they use large-print books or Braille. They are noted to be retarded by at least one or two years and are found to be under-achievers. Visual impairment is the main factor for their slower acquisition of information. These children have a slower reading rate and lack concreteness in instructional procedures. Although the blind children and the low vision children are behind their sighted peers in academic achievement, their academic achievement is not affected as greatly as that of hearing-impaired children.

iii) **Slower Speech Development**

Totally blind children cannot learn the art of speech by imitation. They can only learn through what they hear and from occasional touch observation. Progress in speech development is not significant in comparison with their sighted peers due to the above reason. Research evidences indicate that acquisition of words may get hampered by blindness also. So, these students should be provided with as rich an exposure to language as possible at as young an age as possible.

It is a known fact that personality development includes both hereditary and environmental factors. It is a psychological organisation of the individuals modified by their life experiences. Congenitally blind children have life experiences, which are totally different from the life experiences of their sighted peers. These differences hamper their personality development to a considerable extent. Due to their impairment, the blind children are more likely to experience nervous strain and the feeling of insecurity and frustrations are common with them.

v) Problems in Social Adjustment

There is a great deal of conflicting evidence on whether visually impaired children are less well-adjusted than their sighted peers. It is society's reaction to the blind person that determines the blind children's social adjustment or lack of it. When these children are looked down upon and ridiculed by sighted individuals, they feel inferior and this ultimately leads to maladjustment. Some research workers feel that visually impaired children are maladjusted in school but others refute it completely.

Check your Progress - 2

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

3. State social and emotional characteristics of visually impaired.

....

4. How are visually impaired children categorised?

....

4.7. IDENTIFYING VISUALLY IMPAIRED CHILDREN

Early identification of visual impairment is indispensable so that correction can be provided at early stage itself before the problem becomes worse or complicated. Total blind can easily be recognised and identified but a detailed examination is necessary to identify low vision children. If the child has total blindness,, it can be detected when the child Lis about one year old. But this is not possible with low vision children. The detection of low vision is a much more difficult proposition. Identification of visually impaired children is also associated with some -behavioural symptoms. Teachers should watch for manifestation of these symptoms in the regular classrooms by any or some student(s). When they recognise such symptoms, they should subject the student(s) to medical examination.

Symptoms the Classroom Teacher Should Watch for

Behaviour

- Rubs eye excessively
- Shuts or covers one eye, tilts head, or thrusts head forward
- Has difficulty in reading or in other work requiring close use of the eyes.
- Blinks more than usual or is irritable when doing close work.
- Holds books close to the eyes.
- Is unable to see distant things clearly
- Squints eyelids together or frowns.

Appearance

- Crossed eyes
- Red-rimmed, encrusted, or swollen eyelids
- Inflamed or watery eyes
- Recurring styles

Complaints

- Eyes itch, burn, or feel scratchy
- Dizziness, headaches or nausea following close eye work
- Blurred or double vision

4.7.1. Methods to Identify Low Vision Children

Generally, three methods are adopted to identify low vision children. They are:

i) Classroom observation,
ii) Ophthalmological examination; and
iii) Visual screening.

i) **Classroom Observation**

Any visual impairment in children can be detected by a careful classroom teacher by keen observation. The visually impaired children, especially the low vision children, are likely to exhibit certain behavioural symptoms. The classroom teacher can make use of the above furnished checklist to identify visual -impairment on the basis of observation. Such students identified as visually impaired by means of classroom observation can be referred for medical examination and visual screening for confirmation of visual impairment and / or assessment of extent of impairment.

ii) **Ophthalmological Examination**

The authentic method for identifying low vision children is ophthalmological examination. By this method, children have to be medically examined before going to school. Low vision is assessed on the basis of visual acuity. Visual acuity is most often measured with the Snellen Chart, which consists of rows of letters for individuals who know the alphabet or Es for the very young and those who cannot read. In the latter case, the Es are arranged in various positions, and the person is required to indicate in what position the "legs" of the Es are facing. Each row corresponds to the distance at which a person with normal vision can discriminate the direction of the Es.

There are eight rows, one corresponding to each of the following distances, 15,20,30,40,50,70,100 and 200 feet. People are normally tested at the 200 foot distance. If they can distinguish the direction of the letters in the 200 foot row, they are said to have 20 / 20 central visual acuity for far distances. If they can distinguish only the much larger letters in the 70-foot row, they are said to have 20/70 central visual acuity for far distances. Thus, those children who have visual acuity falling between 20/70 and 20/200 in the better eye with correction can be identified as low vision children.

iii) Visual Screening

There are screening procedures more thorough than the Snellen chart. Using these screening tests, teachers can identify children in need of a more complete eye examination. Unfortunately, some schools use only the Snellen chart as a screening procedure. But the Snellen chart does not pick up all possible types of visual problems. Visual screening may be undertaken by the District Health Officer also.

4.8. CORRECTION AND MEDICAL TREATMENT

In India, measures for prevention and early detection of blindness have yielded positive results. The awareness about preventive measures, hygienic conditions, and cleanliness of environment created through village level and anganwadi workers, educational programs through mass media etc., have brought down the prevalence of avoidable blindness in all parts of the nation.

Teachers can identify the children having eye problems in schools and in their villages or towns where they are working. Those children with eye problems should be referred to the medical intervention for immediate care and cure.

Several eye hospitals, diabetic treatment centers, Government Primary Health Centers, and Government hospitals conduct eye check-up camps, refractive screening, general health care programs etc., freely. Some of the families are unable to meet the cost for the eye testing and treatment. In this condition, you may refer those children to the hospitals where the services are available free of cost. You can also arrange the eye-camps in your school with the help of government organizations and non-government organizations. Through medical intervention, diagnosis, eye treatment, eye surgeries, and provision of glasses and low vision aids are done for the curable visually impaired. For incurable visually impaired persons, identification, eye check-up, certification of visual impairment and counselling are done by the medical experts. These incurable visually impaired persons are referred to the rehabilitation centers for further services.

Rehabilitation Intervention

Rehabilitation centers for the visual impairment are run by the government and nongovernmental organizations in several places of the State. The persons with visually impairment are referred to those centers which are nearer to the clients for getting service. The rehabilitation centers are taking care of visually-impaired persons in the following ways.

- Identification and diagnosis of visual defectiveness
- Arranging treatment and follow up for restoring vision
- Obtaining certificate of visual impairment, Individual assessment-visual and functional
- Individual counselling and family counselling Provision of training in:
    - Orientation and mobility
    - Activities of daily living etc.
- Social integration Education
- Economic rehabilitation
- Support services and obtaining concessions
- Bringing community awareness and involvement

All the above rehabilitation measures result in public awareness, prevention and cure of visual impairment and complete rehabilitation of persons with visual impairment.

4.9. LET US SUM UP

Visual impairment or disability may be caused by a combination of one or the other causes lying in one's heredity and environment. For the dealings with the problems of visual impairment, early detection and assessment of these problems should always be preferred. The beginning

can be made through a system of common visual screening test carried out with the help of the Snellen chart. It should be then supplemented by the system of functional vision assessment (to assess how well one can use the vision that one possesses), assessment based on the appearance of eyes (physical change in or about the eyes); and assessment based self-reporting (complaints made by the child himself). Based on the findings of such assessment, due help of the specialists and health personals related to eye problems should be taken for the treatment and welfare of the visually impaired children.

4.10. UNIT – END EXERCISES

1. Enumerate the problems of visually impaired children.
2. What are the symptoms that a classroom teacher should notice for visual problem among children?
3. Explain the methods to identify low vision children.
4. Describe the rehabilitation measures for the visual impairment.

4.11. ANSWERS TO CHECK YOUR PROGRESS

1. For educational purpose, blind people are those individuals whose vision is so severely impaired that they must learn to read Braille or use aural methods such as audiotapes and records. Those visually impaired individuals who can read print, even if they need magnifying devices or large print books, are referred to as having low vision.
2. Errors of refraction, Glaucoma, Cataracts and diabetes, Prenatal causes, Improper muscle functioning
3. Social and emotional characteristics of visually impaired children – mal adjustment related to visual limitation, negative self-attitude, etc.
4. Totally blind children, children having low vision.

4.12. SUGGESTED READINGS

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BLOCK – II: EDUCATION OF THE SPECIAL CHILDREN

UNIT V: EDUCATION OF THE VISUALLY CHALLENGED

STRUCTURE

5.1. INTRODUCTION

Senses are said to be gateway to knowledge. Out of our five sense organs, the sense of sight possesses the most unique advantage of providing knowledge and information of the environment surrounding us in a most comprehensive and suitable way. That is why the knowledge gained through a picture of the object, person or event is said to be hundred times better than its mere description in words (i.e., hearing about it). In case we can have a living actual experience of that object or event through direct contact, then the worth of such information and knowledge gained has no parallel to any type of other media or exposure available for its gaining. Unfortunately, the children with visual impairment in one way or the other are denied the valuable opportunities of coming into direct contact with the realities of life and environmental surroundings through their sense of sight and may therefore suffer to the extent of requiring special care, provisions, education and treatment for their well-being, development and adjustment. In the present unit, we would be concentrating upon the education provisions for visually impaired children.

5.2. OBJECTIVES

After reading this unit, the readers shall be able to

1. Know about Visually Impaired Children
2. Define of Visual Impairment

3. Understand the Grades of Braille
4. Acquire knowledge about Technological and Special Aids
5. Develop an insight into how to instruct visually impaired children
6. Know the utility and availability of special instructional materials devised for visually impaired children.

5.3.EDUCATION OF VISUALLY IMPAIRED CHILDREN

Lack of sight can severely limit a person's experiences because a primary means for obtaining information from the environment is not available. What makes the situation even more difficult is that educational experiences in the typical classroom are frequently visual. Nevertheless, most experts agree that we should educated visually, impaired students in the same general way as sighted children. Teachers need to make some modifications, but they can apply the same general educational principles. The important difference is that visually impaired students will have to rely on other sensory modalities to acquire information.

The students with little or no sight require special modifications in four major areas: (1) Braille, 2) use of remaining sight, (3) listening skills, and (4) mobility training. While the first three pertain to academic education, particularly reading, the last refers to skills needed for everyday living. Education should provide for smooth transitions from school life to social life.

5.4. BRAILLE

In nineteenth century France Louis Braille, who was himself blind, introduced the basic system of writing for the blind people that is used today. Braille based his alphabet on a system that had been developed by a French Officer, Charles Barber, for writing messages that could be read at night. The Braille method was offered as a replacement for raised line letters. In 1932, Standard English Braille was established as the standard code. As a result, all Braille readers could read, no matter who had trained them.

5.4.1. Grades of Braille

The basic unit of Braille is a quadrangular cell. This -cell contains anywhere from one to six dots. The different forms of Braille vary primarily in the number of contractions used. Grade 1 Braille, for example, contains no contractions. On the -other hand, Grade@Braillenakes considerable use of contractions and the shortened forms of words. Grade-1 Braille is easier -to learn because it 'is more literal. But the Grade 2 Braille is the popular choice because it requires much less space and can be written and read much faster.

5.4.2. Two Means of Writing in Braille

There are five means of writing in Braille. They are the

i) Perkins Brailler and
ii) The slate and stylus.

The Perkins Brailler has six keys, one for each of the six dots of the cell. The key, when depressed simultaneously, leave an embossed print on the paper. The Slate and Stylus are more portable than the Perkins Brailler, but more difficult to use. The stylus must -be pressed through the openings of the slate, which holds the paper between its two halves. The slate and stylus are also slower because the stylus makes am indentation in the paper, so the Braille cells have to be written in reverse order.

5.4.3. Limitations of Braille

A number of factors diminish the utility of reading Braille. First, it is difficult to learn, much more difficult than learning to read print. The contractions do not correspond to phonic rules. Also, reading Braille relies on memory to a great extent. As the perceptual unit is the single cell, readers have to perceive the matter much more sequentially. In addition to the above difficulty, they cannot perceive a number of words at once, as can sighted persons reading print, Braille readers read much more slowly. Another factor that limits the utility of Braille is that the books are very large and take up a great deal of storage space. It is difficult to obtain reading material in Braille.

5.4.4. Status of Braille Now

Because of Braille's limitations and because of advances in technology in other areas, fewer blind people rely on Braille than once was the case. Research surveys indicate that only about 15 percent of the blind population reads primarily by Braille. Thanks to a variety of technological devices, those who have little or no sight are turning more and more to auditory materials for their reading, and more and more low vision individuals are reading regular and large-print materials.

Use of Remaining Sight

There are many problems associated with reading Braille and the vast majority of visually impaired children have quite a bit of useful vision. So, the teachers should encourage visually impaired children to use their sight as much as possible. The visually impaired children should read print because it ensures greater speed, the ability to portray pictures and diagrams and greater accessibility of reading materials.

Two Methods of Aiding to Read

There are two general methods of aiding visually impaired children to read print. They are large-print books and magnifying devices. Large-print books are simply books printed in large-size type. This text, printed primarily for sighted readers, is printed in 10-point type. Type sizes for visually impaired readers range up to 30-point type, but 18-point is one of the most popular. The major difficulty with large-type books is that a great deal of space is required to store them. Also, they are of limited availability. Magnifying devices range from glasses and hand-hold lenses to closed-circuit television scanners that present enlarged images on a TV screen. These devices can be used with normal — size type or large-type books.

Listening Skills

Listening skill is very important for blind children. If the child is not able to rely on sight for gaining information from the environment, it is more crucial for him to become a good listener. It is wrong to assume that good listening skills will automatically develop in blind children. Research evidences indicate that blind children do not spontaneously compensate for poor vision by magically developing superior powers of concentration. In most cases, they must be taught how to listen. There are a variety of curriculum materials and programmes available to teach children listening skills.

The popularity of recorded material as a method of teaching visually impaired individuals have made listening skills more important. Visually impaired individuals now have access to records and tapes and a variety of recording devices. Use of recordings has distinct advantage over Braille or large-print books. The individual can cover the same material more quickly in a variety of ways. They can simply play the material at normal speed. This allows the individuals to "read" much faster than would be possible with Braille. The most satisfactory method in terms of efficiency is to use a compressed speech device, which allows one to read at about 250 to 275, words per minute.

There are some disadvantages in using recordings. First, the student will come to rely too heavily on them and will not learn to use residual vision. Moreover, recordings are not available for everything. Listening to recordings requires a great deal of concentration. Any momentary lapse in attention will cause the student to miss what is being said.

Mobility Training

How well individuals are able to cope with visual disability largely depends on how well they are able to move about. Whether a person withdraws from social environment or becomes independent depends greatly on mobility skills. There are four general methods available to aid visually impaired children in mobility. They are: (1) human guides, (2) guide dogs, (3) the long cane, and (4) electronic devices.

Human Guides

The human guide provides the visually disabled person with greatest freedom in moving about safely, but this arrangement is not practical in most cases. Furthermore, too much reliance on another person causes a dependency that can be harmful. Most blind people who travel unaccompanied do not need help from those around them. Sometimes they may need verbal directions. If at all they need physical guidance, we should allow them to hold onto our arm above the elbow and walk a step behind us. We should not grasp the arm of blind individuals and "push" them 'in the direction they are heading.

Guide Dogs

Contrary to popular notions, a guide dog is also not recommended very often. Extensive training is required to teach the visually 'impaired person

how to use a guide dog properly. The guide dogs are large and walk fast. So, they are particularly inappropriate for children. Also, like any other pet they must be cared for Another disadvantage is that the dog does not "take" the blind person anywhere. The blind person must first know where he or she is going; the dog is primarily a safeguard against walking into dangerous areas.

The Long Cane

Professionals most often recommend the long cane for those visually impaired individuals in need of a mobility aid. The long cane is the most effective and most efficient mobility aid yet devised for safe, independent travel by the majority of visually impaired people. The scanning system in which the user operates the cane provides echo-ranging cues and force-impact data that give vital information about immediate environment. It informs the user about the nature and condition of the surface underfoot, gives sufficient forewarning of down steps or drop-offs to prevent falls or injury, and protects the lower part of the body from collision. The cane informs the user about various ground-surface textures, which can be related to specific areas and destinations. It allows investigation of the environment without actual hand contact. The long cane is reliable, long lasting and somewhat unaffected by unfavourable weather and temperature conditions. Although watching a skilled user of the long cane may give the impression that it is easy to manipulate, blind persons usually require extensive training in its proper use.

Electronic Devices

Researchers have developed quite a good number of sophisticated electronic devices for sensing of objects in the environment. Many of them are still experimental, most are quite expensive. The Laser cane and the Sonic guide are good examples. These devices operate on the principle that human beings, like bats, can learn to locate objects by means of echoes.

The Laser cane has the advantage of being used in the same way as the long cane or as a sensing device that emits three beams of infrared light one up, one down, and one straight ahead. These are converted into sound after they strike objects in the path of the blind person. The Sonic guide is still very much in the experimental stages. This ultrasonic aid may eventually help blind infants gain awareness of their spatial environment and objects within it. This device is worn on head. It emits ultrasound and converts reflections from objects into audible sound. On the basis of the characteristics of the sound, such as its pitch and clarity, and its direction, the sonic guide wearer can learn about such things as the distance, texture, and direction of objects in the environment. There are a number of unresolved issues relating to its use because the sonic guide is still experimental. So, we have to keep in mind that electronic devices are:

1. Still experimental; we need to know a lot more about them.
2. Still very expensive; they are not available to everyone.
3. Not a substitute for more conventional techniques such as the long cane.
4. Not easily used; they require extensive training.
5. Not a substitute for spatial concepts; the blind person needs a fundamental sense of his or her spatial environment.

Education for Transition

The very purpose of education for visually impaired adolescents is to ensure smooth transition from well-protected school life to highly competitive social life. Education for transition includes two closely related major areas independence and employment. Blind people's major impediments to securing an appropriate job lie in the area of independent living.

Independent Living

Visually impaired adolescents or adults constantly struggle to develop and maintain a sense of independence. It is a common mistake to assume that such an individual is helpless. This feeling is an outcome of our own experiences. When we enter a dark room for the first time, we feel defenceless, fearful. Visually impaired people, on the other hand, have had many opportunities to become accustomed to seeing little. So, they are not at the same disadvantage as sighted people who suddenly find themselves in a situation in which there is little or no visibility.

In "The making of Blind men", Scott blames the dependency of blind people on the numerous organisations, agencies, and programmes created to serve them. He claims that blind people become dependent on the agencies for services and employment as they are taught to play a dependent role by these agencies. To promote independence in blind individuals the following suggestions should be adhered to.

1. Sighted people should not treat blind people in a stereotypical and demeaning manner for it will foster their dependency.
2. Sighted people- should respect and encourage the blind person's individuality, capabilities and independence.
3. Blind people often do not need help. So, the sighted people should not feel embarrassed or rejected if a blind person declines their offer of assistance.
4. Sighted people should try to avoid being over solicitous or overly protective. Blind people have the right to make mistakes, too.
5. Sighted people should feel free to approach and talk to a blind person. They can ask any question they wish. The blind person has the right to respond as he wishes.
6. When the sighted people leave the presence of a blind person, they should let him or her know that,
7. If sight people have business with a blind person, they should speak directly to the person rather than to sighted companions or relatives to get information.

If the sighted people adhere to the above suggestions, it will diminish the dependency of blind persons. Many things that sighted people can learn incidentally, we need to teach explicitly to visually impaired individuals, for example, how to work household appliances, eat at a table, or prepare food for cooking. It is the degree of their independent living that determines their success in employment.

Employment

Many working age blind adults are unemployed, and those who are working are often overqualified for the jobs they hold. Teachers should take an active role in helping visually impaired adolescents develop appropriate career aspirations, and job performance skills. Most authorities believe that although the emphasis on such preparation should be strongest in secondary school, it should begin in elementary school. Moreover, job training will be more likely to succeed if it is provided in regular work settings rather than in simulated settings in the classroom. The purpose of the training is not only to teach specific job tasks but also to give students a variety of real work experiences. In doing so, the students will be better prepared to make career decisions as adults. Besides, such an approach will provide the students with ample opportunities to develop generic work behaviours such as punctuality, grooming, following directions, and social skills, which will carry over to other work or community environment.

Check your Progress-1

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

1. What is Braille?

....

2. Name the aids available to help the visually impaired children in mobility.

....

5.5. INSTRUCTIONAL MATERIALS

Children whose vision is severely impaired are usually diagnosed before they enter school, whereas the low vision students often are identified during vision screenings conducted in school. But these routine examinations are not fool proof. So, the teacher has to employ observation technique. Teachers have many opportunities to observe children reading under a variety of conditions and to provide record of their observations by noting the symptoms of vision problems discussed in the identification section of this chapter.

Once the low vision children are identified in the general education classroom, the teacher should make use of special instructional materials to teach those visually impaired children in the general education classroom. The major difference between low vision children and blind children is their ability to read print. Students who have low vision can read _print, although they may use magnifying glasses and require materials written in large print. On the other hand, blind children must be instructed by using Braille and aural methods, including records and audiotapes. Therefore, the visually impaired children in the mainstreamed classroom require adaptation of instructional materials. Although the itinerant or resource teacher will prepare or provide instructional materials written in Braille, it is the tape-

recording instructional lessons, assignments and tests that saves time and reduces the need for planning in advance. In addition, there are several organisations that provide audiotapes and records of a variety of textbooks and materials for pleasure reading.

In addition to adapted printed materials, there are a variety of other aids that visually impaired students can use in the general education classroom. Such aids are listed here category wise.

A. Geography aides
    1. Braille atlases
    2. Moulded plastic relief maps
    3. Relief globes
B. Mathematical aids
    1. Abacus
    2. Raised clock faces
    3. Geometric area and volume aids
    4. Braille rulers
    5. Talking calculators
C. Writing aids
    1. Raised — line check books
    2. Signature guides
D. Miscellaneous aids
    1. Audible goal locators, used as a goal, base, or object locator or a warning device.
    2. Braille or large type answer sheets.
    3. Science measurement kits including items such as thermometers, spring balances, gram weights.
    4. Sports — field kit including raised drawings of various sports' playing fields or courts.
    5. Simple machine kits including working models of pulleys, levers, plane, wheel, and axle.

Although students with low vision can read print, they also require adaptation of instructional material. They very much need modifications in written materials.

5.5.1. Written Materials for Low Vision Children

- Use purple dittoes as little as possible and then only when there is clear, sharp copy that has been typed in large print. Avoid handwritten dittoes.
- Use black ink on white paper or soft lead pencils and fibre-tipped, black ink pens on unglazed light and tinted paper, and use good quality typewriter ribbons to enhance the legibility of written materials.
- Arrange written materials on the page so that they are not crowded.
- Use only one side of the paper
- Outline dim areas of materials with a felt-tip pen.
- Select materials with non-gloss surfaces and high contrast.
- Write clearly in large print when preparing printed materials or when writing on the chalkboard.
- Keep chalkboards clean and write with a white chalk to enhance the contrast.

- Arrange for visually impaired children to sit in areas of high illumination when they are using duplicated materials.

5.6. TECHNOLOGICAL AND SPECIAL AIDS

The recent technological explosion has resulted in new electronic devices for the use of visually impaired individuals. The following describes the technological aids for visually impaired.

Optacon is an electronic device very useful for visually impaired children for reading. The user of this device passes a hand-held scanner over printed material with one hand, and the visual letters are converted by pins into tactile letters on the index finger of the other hand. There is also an optacon Il available that blind person can use to scan computer screens. These optacons are portable and also, they make accessible many different kinds of materials, like magazines, newspapers, and computer screens. There are some disadvantages such as they are expensive and they allow slow rate of reading.

Kurzweil Reading Machine is another innovation, which has an advantage over the optacon in allowing a reading rate as fast as human speech. This small computer converts print into synthesised speech. The material is placed face down on a scanner and is "read" by an electronic voice. But this machine is so expensive that many institutions cannot afford for it.

Versa Braille is another electronic device very useful for those who still wish to use Braille as a medium of instruction. Versa Braille saves time and space. The blind person records Braille onto tape cassettes and plays them back on the machine's reading board. A distinct advantage over traditional Braille is that the recorded material takes up much less space. There is also a versa Braille Il plus, which can be used to convert letters on a personal computer screen into Braille.

Talking calculator is an electronic device that can be effectively used for mathematics instruction. These devices "talk" to users by "saying" the numbers as they are punched and then "saying" the answer.

There are some special software's that would help the visually impaired and blind students. Some of them are discussed below.

Large Print Access
Screen Magnification Software
ZoomText- a family of products (ZoomText, ZoomText Plus, and ZoomText Xtra!); magnifies text and graphics programs. Magnify the full screen, a portion of the screen or a single line at a time.

In LARGE- (tm) is a screen magnification software package for low vision and learning-disabled Macintosh users. The program features the ability to enlarge any portion of the screen from 2 to 16 times, automatic scanning, a crosshairs option for easy cursor location, the ability to invert the screen to white on black, horizontal and vertical image stretching, and a control panel interface.

Lunar - Lunar is the world's leading screen magnification program for visually impaired computer users. It has a number of advanced features to

help you manage the enlarged screen more efficiently. Magnification from 2x to 32x with five different viewing modes. Image smoothing for clear text and graphics at any size. Change screen colours with easy to use TV-style sliders.

CCTV and Magnification Scanning Systems

CCTV- "A closed-circuit television (CCTV) system uses a stand-mounted or hand-held video camera to project a magnified image onto a video monitor or a television (TV) screen" (from AFB information sheet). A CCTV includes the following basic features: video camera with zoom lens (hand-held or stand); monitor or television (attached camera or external); provide enlarged image of material under camera; magnification range of 2X to 60X+; switchable polarity (black text/white background or white text/black background); controls for focus, magnification, brightness, contrast; X-Y viewing table for easy material movement; variety of monitor sizes (5 inches to 20+ inches); black and white camera with colour monitor (allows user selectable foreground and background colours); colour camera with colour monitor (view full colour enlarged images); controls for foreground and background colour, split image, colour or b/w presentation; line markers or windowing (horizontal and/or vertical screen masking that provides a user selectable viewing window for reading); motorized viewing table.

Speech Access

Talking Word Processors

Intellitalk- Talking word processing program. Allows student to hear the letter, word, sentence or phrase as it is entered into the computer. **Write: OUTLOUD**- similar to Intellitalk. Allows the student to set background and font colours, and then save the configuration (will look the same overtime).

Speech synthesizers

Hardware versions- can be internal card devices or external serial devices; allow specialized software programs to integrate speech output. Depending on the software program used to read the screen, the synthesizers can work in the DOS, Win 3.x, or Win 95 environment. (Very rarely ever used). **Software versions**- works in the Windows 95/98 environment with a Sound Blaster compatible sound card. If the sound card is used with a screen reading software program, WAV files will not play.

Screen Review Software

JAWS- stands for Job Access with Speech. Smart Screen is the hands-off screen reading technology that allows to speak any program automatically. It intelligently looks at the screen and determines what to speak so unfamiliar applications can be used immediately. Menus, dialog boxes and HELP files are spoken without the need for user setup. JFW announces each time a new window is opened or closed, and whenever it gets the focus. JFW uses two cursors. The PC cursor tells you where you are typing on the screen, menu item selected, etc. The JFW cursor acts like the Mouse cursor. It roams around the screen like a person’s eyes, going and seeing where the PC cursor cannot go.

Window Eyes-

Window-Eyes was designed to add voice access to Windows 95/98. Window-Eyes is a stand-alone Windows application which gives you total control over what you hear, when you hear it, and how you hear it.

Braille Access

Braille Translation Software

More and more people want an ever-greater variety of materials in braille. Braille2000 - Braille editing tool that handles all kinds of direct entry Braille tasks with automated page layouts to aid the production of literary, textbook, and music Braille.

Braille Embossers

Simply a printer whose output is braille instead of print. Can be used with any computer using a braille translation software program. What follows is an alphabetical list of all the tested embossers and what they did.

Scanned Material Access

Open Book - Open Book uses a scanner to take a picture of the page, which it sends it to your PC, translates the picture into understandable text, and then speaks the text aloud or outputs to Braille. You can scan and read a page in less than a minute: in English or in more than a dozen other languages.

Check your Progress-2

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

3. Name some technological aids that are available to help the visually impaired children in mobility.

....

....

5.7. LET US SUM UP

Visually impaired children, needs special care, attention and educational provisions for their adjustment and educational progress. Therefore, adequate care should be taken regarding taking decisions (i) about their educational placement (ranging from the separate residential schools to the regular class placement), (ii) about the curriculum or learning experiences provided to them, and (iii) concerning curriculum implementation, etc. well in tune with the severity or the problems of visual impairment suffered by them and also the resources available for taking care of their education in one situation or the other.

5.8. UNIT – END EXERCISES

1. State the merits and demerits of Braille method.
2. Highlight the importance of listening skills for blind children.

3. Explain the instructional materials used for visually impaired children.

5.9. ANSWERS TO CHECK YOUR PROGRESS

1. Braille is the basic system of writing for the blind people that is used today
2. Aids to help visually impaired children in mobility – human guides, guide dogs, long cane and electronic devices.
3. Optacon, Verza Braille, Talking calculator, Screen magnification software's, CCTV & Magnification scanning system, talking work processors, speech synthesizers, Braille Translation software and open book.

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UNIT VI: SPEECH AND HEARING-IMPAIRED CHILDREN

STRUCTURE

6.1. INTRODUCTION

Speech impairment refers to the abnormal speech patterns or disorders in speech which cannot be understood by the listeners. Speech impairment creates difficulties for the speaker to communicate his feelings and ideas to others. This is why speech impairment is often called as communication impairment or communication disorder. A child with speech impairment or any other normal child, he can do and perform tasks like other non-impaired child, but he has difficulties in situations which involve speech and verbal ability.

Hearing impairment refers to a defect in or damage to the hearing mechanism. This defect or damage may occur in any part of the ear outer ear or middle ear or inner ear. Hearing impairment leads to hearing disability or loss of hearing, mild to moderate to profound. A person may become deaf or hard-of-hearing depending upon the nature of impairment and the degree of hearing loss. This chapter deals with nature, causes and categories of speech and hearing impairments.

6.2. OBJECTIVES

After reading this chapter, the readers should be able to:

1. Define speech and hearing impairments.
2. Understand the causative factors of speech and hearing impairments.
3. Classify speech and hearing-impaired children.

4. Identify speech and hearing-impaired children.
5. Develop an insight into the educational provisions of these impaired children.
6. Understand the role of sophisticated technology in the education of speech and hearing-impaired children.

6.3. SPEECH AND HEARING-IMPAIRED CHILDREN

Communication is such a natural part of our everyday lives that we usually do not think about it. Speech and language are tools used for purposes of communication. Communication requires encoding (sending in understandable form) and recording (receiving and understanding) messages. Communication involves a sender and receiver of messages, but it does not always involve language. For example, animals communicate through movements and noises. We are concerned with communication through language.

Social conversations with family, friends, relatives, and casual acquaintances are normally so effortless and pleasant that it is hard to imagine anyone having difficulty with it. On the other hand, most people have feelings of inadequacy of their speech or language only in stressful or unusual social situation.

6.3.1. Definition

Speech is the behaviour of forming and sequencing the sounds of oral language. It is the most common symbol system used in communication between human beings. Speech disorders are impairments in the production and use of oral language. They include disabilities in producing voice, making speech sounds (articulation), and producing speech with a normal flow (fluency). When the speech of a person differs significantly from others to the extent of calling attention to itself or interfering with communication, it is diagnosed as a speech defect. The number of children suffering from speech defects is much more than that from any type of impairment.

Children with communication disorders are not receiving an appropriate amount of services from speech language pathologists and audiologists.

There is a need for more speech language pathologists in the schools, as well as greater knowledge of communication disorders by special and general education teachers and greater involvement of teachers in helping students learn to communicate effectively.

6.3.2. Types and Characteristics of Speech Disorders

Speech disorders can be classified on the basis of etiology according to which it may be organic or functional. Organic group includes speech disorders caused by palatal anomalies dental irregularities, paralysis and tumours of the larynx, brain damage etc. Functional group represents failure to learn speech due to general personality and emotional disturbances. But this dichotomy is not crystal clear. Some authorities think that the classification of speech disorders depends mainly on the purpose of classification. It may be classified according to the major symptoms, such as

voice disorders, articulation disorders, delayed speech, fluency disorder. An individual may have more than one disorder of speech and speech and language disorders sometime occur together.

6.3.3. Voice Disorders

People's voices are perceived as having pitch, loudness, and quality. Changes in pitch and loudness are part of the stress patterns of speech. Vocal quality is not only related to production of speech sounds but also to the non-linguistic aspects of speech. Together, the three dimensions of voice are sufficient to reveal a person identify. It is very difficult to precisely define voice disorders. Voice disorders are characteristics of pitch, loudness, and / or quality that are abusive of the larynx and hamper communication. Voice disorders are perceived as markedly different from what is customary for someone of a given age, sex, and cultural background.

Disorders of phonation are voice disorders that involve a dysfunction within the larynx.

Disorders of resonance are voice disorders that involve the dysfunction of the oral and nasal air passage ways.

6.3.4. Articulation Disorders

Distinctions between articulation disorders are sometimes difficult to make. Phonology refers to the study of the rules for using the sounds of language. When a person has difficulty in communicating because he or she does not use speech sounds according to standard rules, the disorders, is phonological. Articulation refers to the movements of the articulators in production of the speech sounds that make up words of our language.

Articulation and phonological disorders involve errors in producing words. Word sounds may be omitted, substituted, disordered or added. Missing, substituted, added, or poorly produced word sounds my make a speaker difficult to understand or even unintelligible. Such errors in speech production subject the speaker to teasing or ridicule.

i) Fluency Disorders

Normal speech is characterised by some interruptions in speech flow. All of us occasionally get speech sounds in the wrong order (relevant for relevant), speak too past to be understood, pause at the wrong place in a sentence, use an inappropriate pattern of stress, or become disfluent. We stumble, backtrack, repeating syllables or words, and fill in pauses with "uh" while trying to think of how to finish what we have to say. Students with fluency disorders take intensive effort to speak. Frequency of interruptions in their flow of speech is so high that it keeps them from being understood or draws extraordinary attention.

The most frequent type of fluency disorder is stuttering. About 1 percent of children and adults are stutterers. More boys than girls stutter. Most stutterers can be identified by at least age five. But parents can perceive their child as stuttering as early as twenty to thirty months of age. Most of

the stutterers begin to show an abnormal speech pattern between two and five years of age. Many children outgrow their childhood disfluencies.

ii) Delayed Speech

Statistics reveal that this disorder occurs with greater frequency than any other communication disorder. Different studies report that the sole cause of delayed speech is hearing loss, mental retardation, cerebral dysfunction, emotional disturbances and environmental deprivation. Very often, children do not speak at the usual age due to lack of motivation. Of course, there are many causes of delayed speech and the diagnosis and treatment involve services from a number of professionals. Given proper training, the children with delayed speech can develop their ability to speak well and will be able to speak as fluently as others before they become adults.

6.3.5. Causes of Speech Disorders

There are various causes of speech impairment. Some important causes are discussed below.

i) Organic Causes

Palatal anomalies, dental irregularities, paralysis and tumours of the larynx, brain damage is some of the organic causes of speech disorders. In some cases (deformation of jaw and lips also result in lisping. Cleft-palate causes voice and articulation disorders.

ii) Functional Causes

Although some children have normal speech mechanisms, they have disorders in articulation and voice. Imitation of an older sibling, a playmate, or an adult may be the sole cause for this type of anomaly. It is to be noted that children usually learn to articulate, vocalise and use language "by ear". They learn to speak in such manner as they hear. Therefore, speech disorders are based on imitation of adult's behaviour.

iii) Psychogenic Causes

Recent research studies indicate that many speech disorders are psychogenic. When the causes of speech disorders are not organic or functional, they can be attributed to the children's reactions to the environment they live in, particularly their parents. Functional articulatory disorders of children are definitely and significantly associated with maladjustment and undesirable traits on the part of the parents.

iv) Psychological Causes

Speech disorders can be ascribed to emotional and psychological origin also. The efficacy of the speech organs alone cannot guarantee good speech. Good speech depends on the personal maturity of the child, his attitude to himself, his relationship with others, and the degree to which the home has stimulated and encouraged speech. Some authorities observe that speech disorders are the outcome of disturbed feeling or emotions, faulty language habits arising from social pressures.

v) Loss of Hearing

Normal auditory system is very essential for development of speech reception skill. If the child has hearing impairment, the auditory input will be distorted. This will result in deviation or delay in development of speech reception skills. This faulty feedback system will affect speech production. Research findings indicate that the degree of hearing loss has a direct bearing on the production of speech and language.

vi) Social Influences

Language is a means of communication. Social environment is essential for development of language skills. If the environment is impoverished, children may not get due stimulation. They may not get adequate opportunities to learn new words. Stimulating homes, schools, and peer group play a pivotal role in the language acquisition and achievement of children. That is why children from higher professional groups evince early speech development.

vii) Cerebral Palsy

Children who are victims of cerebral palsy often lack stimulation to speak. Therefore, they should be highly motivated for speech therapy.

Spastics, athetoid and ataxic children often have a good number of speech disorders. Spastic child evinces articulatory deviation and athetoid child shows slurring in rhythm and constant change in pitch.

6.3.6. Education for Speech Impaired Children

Helping children overcome speech and language disorders is not the responsibility of a single profession. Identification is the joint responsibility of the classroom teacher, the speech language pathologist, and the parents. By listening attentively and empathetically when children speak, providing appropriate models of speech and language for children to imitate, and encouraging children to use their communication skills appropriately, the classroom teacher can help not only to improve speech and language but also to prevent disorders from developing in the first place.

6.3.7. Role of The Teacher

Teachers play a pivotal role in the speech development of students. By virtue of their position and everyday observation the teachers can easily observe any deviation in the speech of their children. Early identification is very important to provide prompt remediation or correction. There are certain symptoms or indicators, which are, associated with specific speech disorders. An insight into these symptoms is essential for the teacher to devise or plan appropriate remediation or correction. Some of these indicators are discussed below.

6.3.8. Indicators of Articulation Disorders

1. Omission of certain sounds from speech (e.g. ca for car)
2. Substitution of certain sounds for other sounds (e.g. wabbit for rabbit)
3. Reversal of order of sounds within words (e.g. aminal for animal)
4. Difficulty in saying certain speech sounds (e.g. sh/r/th)

5. Frequent non speech vocalisations (e.g. clicks tongue, hums)
6. Difficulty in performing oral movements (e.g. chewing, yawning, sticking out tongue)

6.3.9. Indicators of Fluency and Voice Disorders

1. Constant congestion or nasality
2. Constantly harsh sounding or breathy sounding voice
3. Continual hoarseness
4. Speaking in a too soft voice
5. Speaking in a sing song voice
6. Speaking in monotone
7. Speaking too slowly or too fast
8. 8 Unusually high or low voice pitch
9. Unusual pattern of stressing words in sentences
10. Struggling to say words (e.g. grimaces, blinks eyes, clenches fists)

After identifying speech-impaired children, the teacher should ensure the following educational provisions.

i) Speech Therapy

When a child is in need of speech or language therapy, he should be referred to an expert or a therapist for consultation. Very often, there may not be any facility in schools for this purpose. If it is so, the parents should be instructed to take the child to the nearest speech or hearing center. Generally, the speech therapists help children in correcting and removing the disorders in articulation. They take effort to minimize stuttering as far as practicable. For treatment of stammering psychotherapists must be consulted, not the speech therapists. It is because some psychological factors are responsible for stammering.

ii) Articulation Correction

Owing to various reasons, the parents are, very often, not in a position to obtain the required help for their children. Under such circumstances, the resource teacher can help the children in the school itself when he has time to spare. The teacher can try to make simple corrections of articulation disorders. If the teacher possesses good articulation and modulation, he will be able to make a good impact on children. He can enable his children to circumvent their deficiency to a considerable extent

iii) Speech Training Activities

Teaching experts can make an impressive contribution by providing the children with practice in using the correct sound after it has been successfully elicited by the speech therapists. Speech training activities must be provided taking groups into consideration. Activities such as rhymes, jingles, and speech games will be very useful in speech training activities.

iv) Extra-Curricular Activities

In addition to the above activities these children should be taken to visit places of interest such as historical, social, cultural, or geographical places. It may be museums, factories, workshops, dams or lakes, animal zoo etc. were they will get adequate opportunities and stimulation to gather new experiences. The interactions the students will have in such places will help them learn many new words. As a result, they will develop their active vocabulary and will be encouraged to embark on new ventures like reading books, journals, magazines etc.

v) Cooperative Learning

To assist students with speech and language disorders cooperative learning is of much value. It facilitates learning and maximizes communication. In cooperative learning, students work together in small groups to reach a common goal. They are accountable not only for their own achievement but also for the learning of other group members. This interdependence makes cooperative learning an effective technique to integrate students with disabilities into mainstream classes because it promotes learning, communication, and positive attitudes among diverse students. Cooperative learning can be used effectively to circumvent the speech disorders of speech impaired children.

Check your Progress - 1

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

1. What do you understand by the term speech impairments?

....

2. State the causes of speech disorders in children.

....

3. Mention the role of teacher in the education of speech impaired children.

....

6.4. HEARING IMPAIRED CHILDREN

Hearing is the main sensory pathway through which speech and verbal communication develop. If a child hears imperfectly, he is likely to speak incorrectly. Again, hearing also influences learning and other aspects of maturation. Early detection of hearing impairment is very important for the child's overall development. A defect in hearing mechanism will result in perceptual problems. Hearing impairment adversely affects our knowledge of the world around us. Further, it also hampers the child's performance in learning. Hearing impaired children are more disadvantaged than visually impaired children. Hearing impairment is a greater barrier to the normal development of language.

6.4.1. Definition of Hearing Impairment

There are many definitions and classification systems of hearing impairment. By far the most common division is between deaf and hard of hearing. These two categories are defined differently by different professionals. The extreme points of view are represented by clinicians and educators. Those who maintain physiological viewpoint are interested primarily in the measurable degree of hearing loss. Children who cannot hear sounds at or above a certain intensity (loudness) level are classified as deaf; others with a hearing loss are classified as hard of hearing. Hearing sensitivity is measured in terms of decibels. Decibels are units of relative loudness of sounds. Zero decibels (0 dB) designate the point at which people with normal hearing can detect the faintest sound. Each succeeding number of decibels denotes a certain degree of hearing loss. Those who maintain physiological viewpoint consider those children with hearing losses of about 90 dB or greater to be deaf and those with hearing losses below 90 dB to be hard of hearing.

But educators do not maintain this viewpoint. They are concerned with how much the hearing loss is likely to affect the child's ability to speak and develop language. Because of the close causal link between hearing loss and delay in language development, educators categorise on the basis of spoken language abilities. Following are the most commonly accepted set of definitions reflecting this educational orientation.

Hearing Impairment is a generic term indicating a hearing disability, which may range in severity from mild to profound; it includes the subsets of deaf and hard of hearing.

A Deaf person is one whose hearing disability precludes successful processing of linguistic information through audition, with or without a hearing aid.

A Hard of Hearing Person is one who, generally with the use of hearing aid, has residual hearing sufficient to enable successful processing of linguistic information through audition.

6.4.2. Types of Hearing Impairment

The age of onset of hearing impairment and the relationship between hearing loss and language delay are important considerations in the classification of hearing-impaired children. The earlier the hearing loss manifests itself in a child's life, the more difficulty he or she will have in developing language. For this reason, professionals classify hearing impaired children as follows.

Congenitally deaf are those children who are born deaf.

Adventitiously deaf are those children who acquire deafness at some time after birth.

There are two other frequently used terms, which are more specific in pinpointing language acquisition as critical.

Prelingual deafness is deafness present at birth, or occurring early in life at an age prior to the development of speech or language.

Polylingual deafness is deafness occurring at any age following the development of speech or language. Experts differ regarding the dividing point between prelingual and post lingual deafness. Some believe it should be at about eighteen months, whereas others think it should be lower, at about twelve months or even six months.

The following classification system is also common. This classification is based on hearing sensitivity.

Mild deaf are those children who have hearing losses between 26 and 54 decibels.
Moderate deaf are those children who have hearing losses between 55 and 69 decibels.
Severe deaf are those children who have hearing losses between 70 and 89 decibels.
Profound deaf are those children who have hearing losses of about 90 decibels or greater.

Some authorities object that any of the various classification systems should not be followed strictly. These definitions are not precise because they deal with events that are difficult to measure and that occur in variable organisms. So, we should not form any hard and fast opinions about an individual's ability to hear and speak solely on the basis of a classification system.

6.4.3. Characteristics of Hearing-Impaired Children

Hearing impaired children have certain distinct psychological and behavioural characteristics. The nature and severity of certain limitation pertaining to hearing impaired children cause certain changes in behaviour. The following are some important characteristics of hearing-impaired individuals.

i) Linguistic Difficulties

Hearing impaired babies babble less than hearing infants by as early as eight months of age, or even earlier. The babbling they make is also of a qualitatively different nature. These differences occur because hearing infants are reinforced by hearing their own babbling and by hearing the verbal responses of adults. Deaf are unable to hear either themselves or others, so they are not reinforced. The lack of feedback is another cause for deaf children's poor speech production. Moreover, deaf children hear and imitate, so they are deprived of an adequate adult model. Owing to the above reason, the hearing-impaired children are abnormally slow in their linguistic development. These children have a limited vocabulary, they lack comprehension of complex words and words with multiple meaning and concept.

ii) Problems in Personal and Social Development

Social and personality development depends heavily on communication. Social interaction is the communication of ideas between two or more people. Because of society's heavy dependence on language, hearing impaired individuals have personality and social characteristics that

are different from those of people with normal hearing ability. As the hearing-impaired Children are frequently cut off from communicating with the population at large, they grow up in relative isolation. They experience considerable difficulty in making friends. They are often perceived as excessively shy. This tendency toward withdrawn behaviour will be more pronounced if they do not have hearing impaired parents or peers with whom they can interact nonverbally. Hard of hearing and, especially, deaf children tend, more than any other handicapped group to mix socially with people who have the same handicap.

iii) Personality Problems

Research evidences indicate that hearing impaired children face personality problems. Partially deaf children experience more confrontation and personality problems 'than the totally deaf children. It is because partially deaf children get more frustrated as they try to reach the level of the normal children whereas of totally deaf children seem reconciled to their fate.

iv) Psychological Characteristics

Whether hearing impaired will develop behavioural problems depends on how well those in the children's environment accept the disability. Hence, family climate critical in determining the behavioural problem of the hearing-impaired children. Children develop inferiority complex because of their inability to adapt to circumstances that require verbal communication. They always compare themselves with their normal peers and judge the attitudes of the society towards them. They feel that the attitude of the society towards them is not normal. They view it as either overprotective or rejective. They feel that they are very different from normal children. This feeling hampers their growth and development of personality.

v) Abnormal Emotional Behaviour

Young hearing-impaired children evince abnormal emotional behaviour. They may throw tantrums to attract the attention to themselves or their deeds or needs. Lack of comprehension ' causes tension and resistance. They are frequently obstinate and have tendency to tease. They become irritated when they find it very difficult to make them understood. Recently, some authorities argue that severe emotional disturbance is nor more prevalent in deaf individuals than in those with hearing.

6.5. CAUSES OF HEARING IMPAIRMENT

Some authorities categorise the causes of hearing impairment under four headings: (l) hereditary and non-hereditary, (ii) congenital and acquired, (iii) prenatal, perinatal, and postnatal, and (iv) physiological and psychological. But, in this text, causes of hearing loss are classified on the basis of the location of the problem within the hearing mechanism.

Conductive, Sensorineural, and Mixed Impairments

There are three major classifications of causes of hearing loss on the basis of the location of the problem within the hearing mechanism. They are conductive hearing losses, sensorineural hearing losses, and mixed hearing losses.

A conductive loss refers to impairments that interfere with the transfer of sound along the conductive pathway of the ear. Anatomically, conductive losses are the result of problems of the outer and / or middle ear.

Sensorineural impairments involve problems confined to the inner ear. In this case, the sound is conducted properly and the difficulty lies in analysing or perceiving it properly. There is no surgical remedy for this malady. Hearing aids for amplification of sound has little to do with this impairment.

Mixed impairments refer to a combination of the first two impairments

Impairments of The Outer Ear

The auricle and external auditory canal of the outer ear are less important than the middle and inner ear for hearing. However, several conditions of the outer ear, particularly the external auditory canal, can cause the child to be hard of hearing. The presence of foreign objects in the external ear causes hearing loss. Tumours of the external auditory canal, if large enough are another source of impairment. Excessive build-up of cerumen, or earwax, can result in hearing problems. Finally, perforation of the eardrum, which may result from any of a number of causes, ranging from blow to the head to excessive pressure in the middle ear, can also produce hearing impairment.

Impairments of The Middle Ear

Abnormalities of the middle ear cause, hearing losses and these losses are generally more serious than those of the external ear. But middle ear problems do not result in deafness. Children with impairments arising from middle ear problems are usually classified as heard of hearing. Most of the middle ear problems are correctable with medical or surgical treatment. Most middle ear hearing 'losses occur because the mechanical action of the assicles is interfered with in some way.

Otitis media is an infection of the middle ear space and it is the most common problem of the middle ear. Although otitis media can affect individuals of any age, it is primarily a diseased childhood, occurring most commonly in children under the age of two years. It can cause temporary conductive hearing loss. If it is not treated properly, it can eventually lead to rupture of the tympanic membrane.

Non-supportive otitis media is also a middle ear problem of some significance. This condition can occur even without infection. It usually results from a disruption of the functioning of the Eustachian table such that negative pressure occurs in the middle ear. It causes the blood serum of the middle ear lining to be sucked into the middle ear cavity. Thus, it causes hearing impairment.

Otosclerosis is a disease of the bone that causes the stages to become abnormally attached to the oval window. Although it rarely occurs in children, it causes hearing impairment when it afflicts an individual.

Impairments of The Inner Ear

The most severe hearing impairments are associated with the inner ear. Inner ear hearing losses present the greatest problems for both educators and clinicians. Causes of inner ear disorders can be hereditary or acquired. The most frequent cause of childhood deafness is heredity.

Acquired hearing losses of the inner ear include those due to bacterial infections, pre-maturity, viral infections, prenatal infections of the mother, unwanted side effects of some antibiotics, and excessive noise levels. There is a relationship between the cause of the hearing impairment and the degree of hearing loss. The most devastating losses occur due to bacterial infections such as meningitis, prenatal infections of mother such as rubella, and hereditary factors.

6.6. IDENTIFYING HEARING IMPAIRED CHILDREN

The teachers can use systematic observation and then specific hearing tests to identify the hearing-impaired individuals. Recent advancement in technology has the gentrification procedure easier. The following are some important techniques for identifying hearing impaired children.

i) Systematic Observation

This method is highly conducive and extremely useful for identifying hearing impaired individuals. There are certain observable points of behaviour pertaining to hearing impaired individuals, which form the base for teachers' initial identification. Some such behaviours are:

- They turn heads on one side to hear better.
- These children are unable to follow directions.
- In the classroom, they always request the teacher to repeat instructions, questions etc.,
- They focus specially on the speaker's lips.
- They always hesitate to participle in group discussions.
- They display restlessness, inattention and speech difficulty.
- Frequent ear eggs are observable.

ii) Case Study

Psychiatrists usually adapt this technique. They collect data directly from the child or from a close relative of the child. While collecting date, the following prints must be taken into account.

- Identification of the child, i.e. name, address, etc.
- Statement of the present problem (symptoms etc).
- Health history (illness, serious disease, surgical operation etc.).
- Developmental history.

iii) Hearing Tests

There are three different types of hearing tests: pure-tone audiometry, speech audiometry, and specialised tests for very young children. Depending on the characteristics of the examinee and the use to which the results will

be applied, the audiologist may choose to give any number of tests from any one or a combination of these three categories.

A) Pure-Tone Audiometry

Pure-tone audiometry is designed to establish the individual's capacity for hearing at a variety of different frequency. A person's threshold for hearing is simply the level at which he or she can first detect a sound. It refers to how intense a sound must be before the person can detect it. Intensity of sound is measures in units known as decibels (dB).

Pure-tone audiometers present tones of various intensities (dB levels) at various frequencies (HZ). Frequency is measured in units known as Hertz (HZ) It refers to the number of vibrations per unit of time of a sound wave; the pitch is higher with more vibrations, lower with fewer. Hertz are usually measured from 125 Hz (low sounds) to 8000 Hz (high sounds). Sounds below; 125 Hz and above 8000 Hz are not measured because most speech does not fall within this range.

The procedure for testing a person's sensitivity to pure tones is relatively simple. Each ear is tested separately. The audiologist presents a variety of tones within the range of 0 to about 110 dB and 125 to 8000 Hz until he or she establishes at what level of intensity (dB) the individual can detect the tone of a number of frequencies - 124 Hz, 250 Hz, 500Hz, 1000Hz, 2000Hz, 4000 Hz, and 8000 Hz. For each of these frequencies there is a measure of degree of impairment. A 50dB hearing loss at 500 Hz, for example, means the person is able to detect the 500 Hz sound when it is given at an intensity level of 50dB, whereas the normal person would have heard it at 0 dB

B) Speech Audiometry

The ability to detect and understand speech is of prime importance. So, a technique called speech audiometry has been developed to test a person's detection and understanding of speech. Speech detection is defined as the lowest level (in dB) at which the individual can detect speech without understanding. But the dB level at which one can understand speech is more important. This is known as the speech reception threshold (SRT). To measure SRT the person must be provided with a list of two syllable words, testing each eat separately. The dB level at which he or she can understand half of the words is often used as an estimate of SRT level.

C) Specialised Test for Very Young Children

A basic assumption for pure-tone and speech audiometry is that the persons being treated understand what is expected of them. None of these will be effective for very young children under about four years of age or for children with other handicaps.

D) Play Audiometry Game.

This technique is used to establish rapport with the children and to motivate them to respond. The examiner set up the testing situation as Using pure tones or speech, the examiner teaches the children to do various activities whenever they hear a signal. The activities are designed to be attractive for young children. For example, children may be acquired to pick up a block, square a toy, or open a book.

E) Reflex Audiometry

Children normally possess some reflexive behaviours to loud sounds, which are useful for the testing of heating by reflex audiometry. More reflex is present at birth. It is defined as a movement of the face, body, arms, and legs and blinking of the eyes. Another response that may be used to determine hearing ability is the orienting response. This response is evident when the children turn their head and body towards the source of sound.

F) Evoked Response Audiometry

Evoked response audiometry is a method of measuring hearing in a person unable to make voluntary responses. In this technique, changes in brainwave activity are measured by using an electroencephalograph (EEG). As sounds heard by an individual are converted into electrical signals within the brain. This method has become very popular with the advent of sophisticated computers. Evoked response eudiometry is very expensive and difficult to interpret. But it has certain advantages. This can be used during sleep even without the awareness of children. This technique is used to establish rapport with the children and to motivate them to respond. The examiner set up the testing situation as School Screening

It is easy to identify children with severe hearing losses but it is not so easy to identify children with mild hearing losses. For that some routine screening procedures are necessary. Screening tests can be administered either individually or in a group. In group setting the examiner presents pure tones to children one at a time or to more than one child at a time. Each child has a pair of earphones and is instructed to keep his or her eyes closed and to raise his or her hand upon hearing a tone.

6.7. EDUCATION FOR HEARING IMPAIRED CHILDREN

The problem that plagues every educator of children with hearing impairment is low to communicate with their students. Also, teaching them how to communicate with others is also a formidable task. There are two approaches to teach communication to hearing impaired children. They are:

1. Oral approach, and
2. Total Communication approach

1) **Oral Approach**

Oral approach advocates teaching deaf people to speak. It is different from manualism, which advocates use of some kind of manual communication. Manualism was popular and very much preferred until the middle of the nineteenth century when oralism began to gain predominance. Currently most educators advocate the use of both oral and manual methods. It is known as total communication approach. Oral approach includes auditory training and speech reading.

Auditory Training

Auditory training vis the procedure of teaching the deaf and hard of hearing children to make use of what hearing. they possess Advocates of this

approach claim that all but a very few totally deaf children are able to benefit from auditory training. The recent technological _advances in the development of hearing aid have augmented the benefit of auditory training Auditory training involves three major goals. They are:

1. Development of awareness of sound
2. Development of the ability to make gross discriminations. among environmental sounds.
3. Development of the ability to discriminate among speech sounds.

Development of Awareness of Sound

The first task in auditory training is to ascertain that the child knows that there are a variety of sounds, including speech, in the environment. Those children who have not used hearing aids since early infancy may experience some difficulty in adjusting to them. The sounds they hear for the first time may sound so overwhelming that they learn "tune them out" So the advocates of auditory training stress the importance of introducing hearing aids as early as possible.

Gross Discrimination of Environmental Sounds.

Once the child develops awareness of sound, the teachers should begin the process of teaching gross discrimination of environmental sounds. This training sometimes requires children to match pre-recorded environmental sounds with their corresponding picture

Discrimination Among Speech Sounds

Discrimination of speech sounds requires much more sophisticated learning on the part of the children than does the discrimination of gross environmental sounds. One of; the reasons for speech discrimination training being so complicated is that everyday speech often occurs among a variety of factors, referred to as "noise", which can reduce the dissimilarity of speech sounds. Speech discrimination training in the early stages should take place under ideal, low noise conditions, E But the children must gradually learn to cope with discriminating speech under conditions, which are relatively high in noise.

Speech Reading

Speech reading is sometimes, inappropriately called lips reading. It involves teaching hearing impaired children how to use visual information to understand what is being said to them. Speechreading is more accurate term than lips reading because the latter refers only to the use of visual cues arising from movement of the mouth in speaking. It does not take into account the other visual stimuli. in the environment in which can help the hearing-impaired persons to understand spoken language. On the other hand, speech reading makes an effective use of visual "information. There are three general kinds. Of visual information that speech readers can try to take advantage of. They are:

1. Stimuli from the environment.

2. Stimuli associated with the message but not part of speech.
3. Stimuli directly connected with the production of speech.

Environmental Stimuli

Speech reading depends greatly on the ability to pay attention to and obtain meaning from the environment. Good speech readers are able to anticipate certain kinds of messages in certain situations.

Nonverbal Stimuli Related to The Speakers

Training in this area involves teaching the children that some actions of the speaker are more likely to be connected with certain messages. Facial expressions are a very good example. For instance, a person talking about a serious accident would not be smiling.

Speech Stimuli.

The most important aspect of speech reading, is the ability to discriminate among the various speech sounds by relying on visual cues from the lips, tongue, and jaw. For example, to learn to discriminate among vowels, the speech reader concentrates on cues related to the degree of jaw opening and lip shaping.

Limitations of Speech Reading

Unfortunately, speech reading is extremely difficulty and good speech readers are rare. There are many. Factors that make speech reading so hard. For one thing, many sounds are produced with little obvious movement of the mouth.

- Also, they find the homophones very difficult to discriminate.
- They cannot distinguish among the pronunciation of (p), (b), or (m).
- There is a great variability among speakers in how they visibly produce sounds.

2) Total Communication Approach

Two factors played pivotal role for the shift that occurred in the 1970s from oral only instruction to total communication, the use of oral and manual methods. The factors are:

1. A number of research studies found that deaf children of deaf parents who had been exposed to manual methods, when compared to deaf children of hearing parents who had not been so exposed, were superior in English skills, academic achievement, writing, reading, and social maturity. In addition, there were no differences in speech between the two groups.
2. There was a growing dissatisfaction with the effectiveness of oral only methods, particularly at the preschool level.

These two factors led to a new approach, known as total communication approach, which makes use of both oral and manual

methods. About two-thirds of all deaf children are now taught by total communication approach and one-third are taught by an oral approach.

Signing English Systems

Signing English systems are the type of manualism most often used in the total communication approach.

Finger spelling is the representation of letters of the English alphabet by finger positions. It is also used occasionally to spell out certain words, such as proper nouns.

Signing English Systems refer to signing systems that have been devised for the express purpose of teaching deaf children to communicate.

It is important to note that signing English systems are not the same thing as true sign languages, such as American Sign Language (ASL) The striking difference between the two for practitioners is that signing English systems follow the same word order as spoken English. So, it is possible to sign and speak at the same time. But the advocates of American Sign Language (ASL) assed that ASL is the natural language of deaf children. Also, it is the most natural and efficient way for deaf students to learn about the world. They argue that signing English systems are not only awkward but also very difficult to use because they pug such a heavy strain on a person's memory.

It will be interesting to See over the next several years how successful ASL proponents are in replacing signing English systems.

Technological Advances

A number of technological advances have made it easier for hearing impaired children to communicate with hearing people. This explosion of technology has taken place primarily in four areas. The four areas are:

Computer-Assisted Instruction

Many professionals advocate microcomputers as an excellent means of teaching hearing impaired children. There are programmes 'for teaching reading, writing, and sign language. This programme allows the children to type a sequence of words, or a sentence that appears on the screen, along with a picture of the sentence and the appropriate signs. Researchers are working on computers that will display 'in visual form the speech produced by the individuals. Visual displays of speech can help deaf "children learn to speak better. Work is being done on developing interactive videodisc systems to help hearing people learn sign language.

Television Captioning and Teletext

There are two types television captions open and closed. Open captions were used with certain programmes in the 1970s. They were seen on all television screens. Their use was short-lived. The main reason was that the general viewing audience complained that they were distracting. Closed captions became available in 1980s. These captions are visible only on television sets equipped with a special decoder.

Some hearing-impaired children are also taking advantage of tele text, which provides access to such information as news, cultural calendars, and community announcements through television.

Telephone Adaptations

Hearing impaired have problems in using telephones because of acoustic feedback, noise from the closeness of the telephone receiver to their hearing aids, and the fact that speech-reading cues cannot be used. The development of the teletypewriter, which connects with a phone, is a welcome aid for hearing impaired students. The teletypewriter allows the hearing-impaired children to communicate through type with anyone who also has teletypewriter

Hearing Aids

There are various kinds of hearing aids, which differ in size, cost, and efficiency. These hearing aids range from wearable hearing aids to group auditory training units, which can be used by a number of children at a time. The wearable hearing aid is the most familiar type known to the public. It comes in a number of models. Some can be inserted within the external auditory canal; some are built into glasses and some can be placed behind the ear. The most powerful kind of wearable aid contains a unit worn on the clothing with an attached earpiece in general, the more inconspicuous the hearing aid is, the less powerful it is. But the recent advances in the manufacture of miniature transistors have boosted up the efficiency of very small units dramatically. This has resulted in a market increase in the use of in the ear and behind the ear hearing aids, especially' the former, which will become even more popular in the years to come.

Group auditory trainers are used in school situations in which amplification is provided for a group of children. Group trainers need not be small enough to wear. So, they are usually more powerful and give better sound quality than the most advanced individual hearing aids.

Hearing aids are an integral part of educational programmes for hearing impaired children; some deaf children cannot benefit from them due to the severity and / or kind of their impairment. Generally, hearing aids make sounds louder, not clearer. So, if a person's hearing is distorted, hearing aid will not be of much use. The sound amplified by the hearing aid will be heard by him distorted. For those who can benefit from hearing aids, it is very important for the children, parents, and teachers to work together to ensure the maximum effectiveness of the hearing aid. It is also important for the teacher to monitor the children's use of the hearing aids closely to make sure that they are using the hearing aids consistently and that the aids are operating appropriately.

Check your Progress - 2

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

4. Enumerate the characteristics of hearing-impaired children?

....

5. What are the approaches that are used in the education of hearing-impaired children.

....

6.8. LET US SUM UP

In this unit you have learnt about the speech and hearing-impaired children, their characteristics, causes of impairment, identifying them and appropriate educational provisions for speech and hearing-impaired children.

6.9. UNIT – END EXERCISES

1. Define hearing impairment. State the different types of hearing impairment in children.
2. Explain the different causes of hearing impairment.
3. As a special educator, how would you identify hearing impairment in children.
4. Explain the different technologies that are used for the benefit of hearing impairment children.
5. Elaborate the educational provisions for speech impaired children.

6.10. ANSWERS TO CHECK YOUR PROGRESS

1. Speech impairments are disorders in the production and use of oral language. They include disabilities in producing voice, making speech sounds (articulation), and producing speech with a normal flow (fluency).
2. Organic Causes-Palatal anomalies, dental irregularities, paralysis and tumours of the larynx, brain damage is some of the organic causes of speech disorders. In some cases (deformation of jaw and lips also result in lisping. Cleft-palate causes voice and articulation disorders.

   Functional Causes- Although some children have normal speech mechanisms, they have disorders in articulation and voice. Imitation of an older sibling, a playmate, or an adult may be the sole cause for this type of anomaly. It is to be noted that children usually learn to articulate, vocalise and use language "by ear".
3. Teachers play a pivotal role in the speech development of students. By virtue of their position and everyday observation the teachers can easily observe any deviation in the speech of their children. Early identification is very important to provide prompt remediation or correction. There are certain symptoms or indicators, which are, associated with specific speech disorders. An insight into these symptoms is essential for the teacher to devise or plan appropriate remediation or correction.
4. Linguistic difficulties, problems in personal and social development, personality problems, and abnormal emotional behaviour.
5. Oral approach and total communication approach.

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UNIT VII: PHYSICAL HANDICAP

STRUCTURE

7.1. INTRODUCTION

Physically handicapped children constitute a heterogeneous group having different types of physically handicap and neuro-muscular disorder. Depending upon their specific handicap these children have limitations in activities such as running, climbing, jumping, walking, lifting loads, etc. They may have problems with use of bones, muscles and joints. But these children do not have problems in learning school-related subjects. They are educable in regular schools with necessary aids and equipment. In fact, a large number of physically impaired children are already studying in regular schools. Most of them successfully compete university education and are well-placed in jobs, politics and in the society. This unit outlines educational provisions for the physically handicapped and discusses the functions of all India institute of speech and hearing impaired.

7.2. OBJECTIVES

After reading this unit the reader shall be able to

1. Develop an insight into education provisions of physically handicapped children.
2. Understand the role of AIISH.

7.3. PHYSICAL HANDICAP

7.3.1. Meaning of Physical Handicap

In our society we come across some children who are supposed to possess normal mental abilities but they are not able to maximize their potentialities due to one or the other type of physical handicap. These physically handicapped children are called differently by different

authorities such as Physically handicapped, crippled, children with locomotor handicap and children with neuromuscular disorder.

A Physical handicap refers to defects in bones, muscles and joints. It is because of the defects (malformation or malfunction) in bones, muscles or joints the child is not able to use the limbs effectively. The child may feel pain in the joints. Such defects may interfere in his educational performance. The term 'crippled' refers to a kind of Physical handicap in which the child's leg (or legs) is deformed or even the child loses his limbs and becomes lame.

The term loco-motor handicap also refers to a type of handicap in which the child's movements are affected because of disease or injury to the lower extremes of the body or nerves or spinal cord or because of loss of one leg or both legs.

Neuromuscular impairment refers to a specific impairment or dysfunction of the nervous system which adversely affects the education of the child.

Thus, the term Physical handicap covers all those conditions which prevent the child from having complete control of his bones, muscles, joints and the nervous system causing his inability to move about and/or use his limbs in a normal way. It includes polio effects, cerebral palsy, amputations resulting from accidents or disease, birth anomalies, muscular dystrophy and spina bifida.

7.3.2. Symptoms of Physical and Neuromuscular Handicap

The symptoms of Physical and neuromuscular handicap are as follows:

i. Observable deformity in the child's limb — legs, arms, palms or feet (more than 40% as per report of the Physician)
ii. Awkward walking
iii. Feeling of pain in the joints
iv. Inabilities to use the bones and muscles
v. Loss of any part of the body
vi. Polio effects
vii. Difficulty in bending the knees
viii. Crippled body
ix. Difficulty in walking/running some distance (x) Abnormally short or weak hands or legs.

7.3.3. Causes of Physical Handicap

There is no single cause of Physical handicap. Rather it is caused by a number of factors which can be grouped under three heads such as:

i. Hereditary,
ii. Congenital and
iii. Acquired or Environmental.

(i) Hereditary Factors

It is a fact that the physique of the child is inherited from parents. Even hereditary defects also pass down from one generation to another

through genes. Some of the physical abnormalities which pass from one generation to another are: Claw hand, cleft palate, cleft lips, club foot, dislocation of hips, spina, bifida, etc.

(i) **Congenital Factors**

Sometimes physical deformities occur due to congenital factors. In such cases the child is born with certain defects such as cleft lip, cleft palate, webbed fingers, club foot, bow leg, missing bones, etc. Some of the congenital factors are:

- Malnutrition of the pregnant mother;
- Infection and disease of the pregnant mother such as mumps, chicken pox, rubella, germane measles, Rh disease;
- High use of chemicals.

(ii) Environmental Factors

In addition to hereditary and congenital factors, environmental factors may also cause Physical handicap. Some of these factors are as follows:

- Premature birth, long and difficult labour, caesarean birth haemorrhage and improper use of drugs may result in birth injuries.
- Infections and diseases such as whooping cough, measles, scarlet fever, tuberculosis of bones and joints and poliomyelitis, cerebral palsy, rheumatoid arthritis, leukaemia and blood cancer may also cause Physical handicap.
- Lack of safety measures causing accidents.
- Nutritional deficiencies.
- War and natural calamities like earthquake, tsunami, etc.
- Lack of first aid for accident.
- Poverty of parents leading to lack of proper care and treatment for diseases.

Characteristics of Physically Handicapped Children:

If a teacher in an integrated education class for the Physically handicapped children desires to give special attention to these children, he should have some knowledge of the principal characteristics of those handicapping conditions. They are as follows:

(i) **Muscular or Neuromuscular Impairment:**

The impairment of children which are manifested by muscle weakness, paralysis, or incoordination are generally most accurately designated as neuromuscular conditions, since the difficulty usually originates in nerves which innervate the musculus rather than in the musculus themselves. Because of the frequent involvement of the nervous system, children in this classification present the most difficult educational problems of any of the subgroups in this area of exceptionality.

(ii) **Poliomyelitis:**

It is the most publicized and best known of the diseases which cause muscle weakness or paralysis. Although paralysis of muscles is the consequences of the disease, it is nerve cells in the grey matter of the spinal cord which are damaged by the polio virus. In case of complete destruction of cells, a return to usefulness of the affected parts depends on utilization of the other muscle groups. Thus some body depends on utilization of other muscle groups.

(iii) **Spina Bifida:**

It is a congenital development condition in which there is a defect of closure of the bony spinal canal. As a result, there is usually a protrusion of the spinal cord through this gap. This causes varying degrees of paralysis in the lower examinations as well as the lower abdominal organs.

(iv) **Cerebral Palsy:**

It cannot be considered a disease in the usual sense of the word. Rather the term is used to designate a number of types of neuromuscular disabilities which are characterised by disturbance of voluntary motor function, especially of the extremities and are the result of the damage to the brain.

(v) **Skeletal Deformities:**

Skeletal impairments in children affect primarily the upper and lower limbs, spine and joints. Such disabilities may handicap a child in walking, sitting, standing or using his hands. They may be congenital, a condition with which the child is born, or acquired as a result of infectious disease, developmental disorders, or accident.

(iii) Children having Limited Strength, Vitality and Alertness:

Physical conditions that are characterized by greatly reduced strength, vitality or alertness, which limit the ability of a child to perform at a maximal level of efficiency in school are often the reason for placement in special education facilities. These conditions may be caused by infectious disease that are permanently disabling or that make necessary long periods of bed rest and convalescence, and by congenital or developmental impairments that have similar results.

7.3.4. Preventive Measures

The idea that prevention is better than cure holds true for Physical handicap as for other disabilities.

(i) Prevention of Physical impairment necessitates the concerted efforts of different professionals — physicians, nurses, social workers, volunteers, rehabilitation personnel.

(ii) Government and non-government organizations should work hand in hand to prevent the occurrence of Physical handicaps.

(iii) Parents, particularly the pregnant mother should be educated through mass media and public awareness programmes about risk factors to be avoided so as to prevent the birth of a Physical handicapped child or acquiring handicap after the birth.

(iv) Safety measures should be ensured in industries to prevent accidents.

(v) Safety education should be an integral part of school education.

(vi) Along with safety education, education about first aid and health education should also form an important part of the school education.

(vii) Community members should cooperate and participate in pulse polio programme and other mass immunization to prevent diseases which cause Physical handicap.

(viii) Whenever the pregnant mothers or children are found to be suffering from diseases, they should be treated immediately by competent physicians to avoid future handicaps that may result from such diseases.

(ix) Rehabilitation personnel have important role to play in the prevention of problems that may arise due to handicap. Physically handicapped persons should be suitably rehabilitated in the society and employments.

(x) Suitable aids and appliances should be made available to physically handicapped children to compensate for their disabilities. The Lions' club, the Rotary club, business firms and NGOs should come forward to provide aids and equipment to physically handicapped children at free of cost.

7.4. EDUCATIONAL PROVISIONS FOR PHYSICALLY HANDICAPPED CHILDREN

Experts in the field of special education hold the view that physically handicapped children, particularly the crippled and others having mild to moderate degrees of handicap do not have learning problems. Like any other non-handicapped child, a physically handicapped child can speak, read, write and solve arithmetic problems and make satisfactory progress in school work; he can have occupational success during adulthood; he can be an effective member of the community to which he belongs. But severely and profoundly handicapped children deprived of specialized training may have problems in these areas:

i. The National Policy of Education (1986, Revised 1992) states "Wherever feasible education of children with locomotor handicaps...will be common with that of others." Thus, physically handicapped children should be educated in regular schools. This is not only feasible; it is also cost effective.

ii. Most of these children are already in the regular schools. They need to be identified early so that interventions can be initiated by the schools.

iii. Education of physically handicapped children in regular schools necessitates removal of architectural barriers in the schools. Because these children have problems of movement and some of them may use wheel-chair and crutches, barriers to their movement such as staircase should be removed and alternate arrangements should be made for them. If possible, their classrooms may be located in the ground floor of the building.

NOTES

iv. For successful education these children may require aids and equipment. The school must arrange to provide aids and equipment from various sources for such children. A child with impairments in the waist, hips and joint pains requires furniture which can be adjusted to his needs. A child having loss of fingers or defective fingers requires special writing materials such as thick pen. A child with a missing limb requires artificial limb. Crippled children may require wheel chair and crutches. The Rotary Cub, Lions' Club and NIRTAR may be approached for this purpose.

v. The school should give opportunity to the physically handicapped to participate in cocurricular activities keeping in view their difficulties and potentialities. Wherever possible handicapped and nonhandicapped children should be involved in the same activities. This will develop in them friendship and mutual appreciation.

vi. The most important thing is teacher's acceptance and attitude towards physically handicapped children. physically handicapped children should be accepted by teachers as equal members of the school community. The favourable attitude of teachers will develop among peers a favourable attitude towards physically handicapped child.

vii. The individuality and diversity of such children should be valued by teachers and opportunity should be made available to them to experience success in academic and co-academic programmes.

viii. In all cases teachers should avoid labelling such children as 'lame', 'crippled' etc. Labelling has adverse effects on psycho-social aspect of their development.

ix. The needs of the child are such that he requires a disproportionate amount of the teacher's time and attention with the result that other children in the room are seriously neglected, this problem too, should be thoroughly studied and not be used as an excuse for special placement by teachers and administrators who do not want to be bothered by a handicapped child in the room. Often the guidance of a consultant can help to solve this difficulty in a manner that will be satisfactory to everyone concerned.

x. The physical impairment of the child often creates emotional problems for the physically handicapped children. Therefore, necessary care should be taken to give individual attention to solve such emotional problems.

xi. Modification of furniture to provide comfort to the physically handicapped is very much essential in a regular classroom.

xii. It is experienced that the physically handicapped children are less well accepted than normal children in an integrated class. Such physical integration does not provide psychological integration. As a result of which, these handicapped children face many psychological problems.

xiii. In the IED class, the physically handicapped children should be provided with necessary learning equipment and adjustment equipment.

xiv. The physical therapists should take much care to enable the physically handicapped child to develop the ability for free movement.

NOTES

xv. The occupational therapist on the other hand should prepare these children for future employment and enable them for participation in activities undertaken by the school. Such participation will help for the development of creativity and self-confidence.

7.5. ROLE OF TEACHERS OF PHYSICALLY HANDICAPPED CHILDREN

It is a well-known fact that IED (Integrated Education of the Disabled) is a programme of education supported by the Government of India. The Central Government gives much emphasis on this programme of education. For the success of this programme the teacher plays an important role. His role in IED is as follows:

i. The teacher must believe in integrating the physically handicapped children with the normal children. He will have to develop necessary Plan of Action (POA) to make this programme a success.
ii. The teacher should know that the physically handicapped children are no way inferior to the normal children in intellectual pursuits. They can learn as efficiently as the normal children. The responsibility of the teacher is only to provide them with some specific teaching aids and help them to learn some fundamental skills of learning.
iii. Early identification of the physically handicapped children is another important responsibility of teacher. Early identification can help these children to learn in the programme of IED.
iv. The teacher should provide them knowledge in some special skills either in the resource room or in a room specifically meant for these children in the mainstream education.
v. One of the important responsibilities of the teacher is to identify the physically handicapped children and help them to recover their loss by the help of some aids.
vi. Instead of addressing them as "disabled" a teacher should encourage them to develop self-confidence. He should also be aware of their ability and disability.
vii. Placement of the physically handicapped children in IED is another important role of the teacher. For their placement the teacher should not only know the performance level of such students but also their ability to work. For this, the teacher will have to take the help of the doctors, psychologists and special teachers in this field.
viii. The teacher should also know the degree of handicap of each handicapped child admitted in the class.
ix. After admitting a physically handicapped child into IED, the teacher should prepare the syllabus and methods of teaching.
x. While introducing a changed subject of study, the teacher should see that the general students and the handicapped students receive equal educational experiences.

xi. The teacher should also see that the child is provided with opportunities to participate in all educational activities.

xii. The teachers should not have any prejudices about the handicapped children. Such children should get the approval of the teacher in a learning activity. Thus, they can be educated in the IED.

xiii. The teacher should try to change the social attitude towards the physically handicapped children. They should get social approval like the normal children.

xiv. The teacher should deliver speeches in public meetings, broadcast programme about the importance of the handicapped children. Different mass media should be utilized for this purpose.

Thus, the feeling of rejection of the handicapped children can be removed from the minds of the normal people in the society.

Check your Progress - 1

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

1. What do you mean by physical handicap?

……………………………………………………………………………………………………

2. State the causes of physical handicap.

……………………………………………………………………………………………………

7.6. THE ROLE OF ALL INDIA INSTITUTE OF SPEECH AND HEARING IMPAIRED (AIISH)

The All India Institute of Speech and Hearing was established in the year 1965 as an autonomous institute fully funded by the Ministry of Health and Family Welfare, Government of India.

The major objectives of the institute are to impart professional training, render clinical services, conduct research and educate the public on issues related to communication disorders such as hearing impairment, mental retardation, voice, fluency and phonological and language disorders.

The institute started with one post-graduate program in the year 1965 and now offers many courses including one Certificate course, 3 Diploma programs (Diploma in Hearing Aid & Ear mould Technology, Diploma in Training Young Hearing Impaired Children and Diploma in Hearing Language and Speech through distance mode); 2 undergraduate programs (B.Sc. in Speech & Hearing and B.Sc. Ed - Hearing-Impairment); PG Diploma programs in Clinical Linguistics and Forensic Speech Science and Technology; 3 post graduate courses (M.Sc. in Audiology, M.Sc. in Speech Language Pathology and M.Sc. Ed-Hearing Impairment). The Institute

offers Ph.D. programs in Audiology and Speech-Language Pathology and also Post-Doctoral Fellowships.

AIISH caters to clients of all ages having a whole range of communication disorders. The institute attracts students from all over India and abroad. It has strived in the past 50 years in furthering the cause of professions of Audiology, Speech Language Pathology and Special Education throughout the country. The enthusiasm to excel in reaching out to individuals with communication disorders knows no boundaries. The institute has been recognized as a Center of Excellence in the area of Deafness by WHO, as a Centre for Advance Research by UGC and as a Science and Technology Institute by DST. The institute has now been recognized as a Nodal Center for the implementation of National Program for Prevention and Control of Deafness of Ministry of Health and Family Welfare, Government of India as well as for generating man power for the same.

AIISH is wholly financed by the Government of India and functions as an autonomous organization under the direction of the Executive Council with the Hon'ble Union minister of Health and family welfare as chairman and the Hon'ble minister of Health and family welfare, Government of Karnataka as the Vice Chairman.

AIISH is committed to bring out quality professionals who can meet the challenges of helping individuals to overcome the debilitating effects of their communication disorders. We hope to set new standards so that future trained professionals are always on their toes to succeed. We are sure that our students will make us and the country proud.

7.6.1. Vision and Mission of AIISH

Vision: To be a world class institute for human resource development, conducting need-based research, striving for excellence in clinical services, creating awareness and public education in the field of communication disorders.

Mission: To promote, sustain and provide globally-competitive, ethically sound human resource, quality education, original research, clinical services and public awareness in the field of communication disorders.

7.6.2. Activities of AIISH

i) **Training**:

Clinical training: The Department of Clinical Services imparts clinical training to diploma, graduate, postgraduate and doctoral students from AIISH for diagnosis and management of persons with speech, language and hearing disorders. The students are provided training in the assessment and management of various types of communication disorders using behavioural standardized tests and state-of-art equipment. In addition to this, their skills are also developed for preparation of teaching aids, clinical documentation of reports and

preparation of intervention plans, home training programs and public education materials.

ii) **Clinical practicum classes:**

Classes are conducted on a weekly basis for student clinicians to bridge the gap between theory and practice. This helps the department to maintain high standards of clinical competence which is focused and completed within a stipulated schedule.

iii) **Short term training for health care professionals:**

Rehabilitation of persons with communication disorders involves a team work. In this connection, short term training programs are conducted for the benefit of the persons with communication disorders and also professionals from allied areas. Orientation, guidance and demonstrations are provided to different groups of professionals such as, post graduate ENT students from medical colleges, PHC medical officers, and special educators, teachers of special and regular schools, parents/caretakers of the differently abled, nurses and grass root health workers.

iv) Clinical Services
Diagnostic Services

- Comprehensive assessment procedures for all types of communication disorders, for different age and language groups by a team of speech-language pathologists and audiologists.
- Consultancy services on a full-time basis by allied professionals such as ENT doctors, Clinical psychologists, Physiotherapist and Occupational therapist.
- Consultancy services on a part time basis by allied professionals such as Paediatrician, Neurologist, Phono surgeon, Plastic surgeon, Prosthodontist and Orthodontist.
- Counselling and guidance for persons with communication disorders and to their caregivers.

v) Therapeutic services:

Therapeutic services on individual and/or group basis for short/long term are provided. They include,

- Language therapy for persons with hearing impairment, specific language impairment, mental retardation, cerebral palsy, autism spectrum disorders, aphasia etc.
- Reading and writing remediation program for persons with learning disability.
- Articulation therapy for persons with misarticulation, cleft lip and palate, dysarthria etc.
- Voice therapy for persons with voice problems.
- Fluency therapy for persons with stuttering, cluttering etc.
- Physiotherapy for persons with neuro-motor problems.
- Occupational therapy and sensory integration for individuals with neuromotor problems.

- Augmentative and Alternative Communication (AAC) training for persons who use limited verbal modality.
- Guidance through correspondence for the needy stakeholders.

vi) Special clinics/units

Clinics are exclusively established with a focus on comprehensive assessment and management of persons with communication disorders. They include

- Fluency unit
- Augmentative and Alternative Communication (AAC) Unit
- Autism Spectrum Disorders (ASD) Unit
- Unit for Structural Orofacial Anomalies (U-SOFA)
- Clinic for Adult and Elderly Persons with Language Disorders (CAEPLD)
- Learning Disability Clinic
- Special Clinic for Motor Speech Disorders
- Voice Clinic
- Listening Training Unit

vii) Itinerant Speech Therapist (IST) services

- It refers to the services offered by a speech-language pathologist (SLP) in the routine environment of the client. SLP will identify the problem faced by the child in the school (parent's report/clinician/supervisor's referral) and prepare a list of such referrals for the next month school visit. During the visit to the school, the teacher will be orientated regarding the modifications to be incorporated to include children with communication disorders in regular class room settings
- Counselling the caregiver regarding the type of school placement (regular/ special/vocational)
- Follow up of discharged demonstration therapy clients/ discontinued cases from speech and language therapy through telephone conversation and counsel them on the importance of follow up
- Counselling the caregiver/individual regarding the importance of home training and follow up during the process of discharge of the child/individual from speech and language therapy
- Orienting the visitors about "The objectives of the department and services offered in the department" during their visit to the Dept. of Clinical Services. Correspondence through e-mail/ letters to the queries of the public about the services offered at AIISH.

7.7. LET US SUM UP

This unit dealt with the nature of physically handicapped children and the educational provisions of physically handicapped children. This unit also briefed the role of AIISH highlighting its activities.

7.8. UNIT – END EXERCISES

1. Give the meaning of physical handicap.

NOTES

2. Enumerate the symptoms of physical and neuro muscular handicap
3. Explain the educational provisions for physically handicapped children.
4. Describe the role of the teachers of the physically handicapped children.
5. Elaborate the activities of All India Institute of Speech and Hearing impaired.

7.9. ANSWERS TO CHECK YOUR PROGRESS

1. A Physical handicap refers to defects in bones, muscles and joints. It is because of the defects (malformation or malfunction) in bones, muscles or joints the child is not able to use the limbs effectively.
2. Causes of physical handicap-hereditary, congenital and acquired or environmental.
3. Vision**:** To be a world class institute for human resource development, conducting need-based research, striving for excellence in clinical services, creating awareness and public education in the field of communication disorders.
   Mission: To promote, sustain and provide globally-competitive, ethically sound human resource, quality education, original research, clinical services and public awareness in the field of communication disorders.
4. Activities of AIISH – clinical training, clinical practicum classes, short term training for health care professionals, clinical diagnostic services, therapeutic services, establishment of special clinics/units and itinerant speech therapist services.

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UNIT VIII: MENTAL RETARDATION

8.1. INTRODUCTION

Children with mental retardation may be heartbreakingly different from the children next door in some ways, but also like them in others. Recent research findings indicate that retardation is quantitative rather than qualitative. In many areas mentally retarded children function like a nondisabled child at a younger Chronological age. Even the differences that do exist need not cause parents a lifetime constant headache. Today many professionals recognise that mental retardation is a socially constructed condition to some extent. It is the individual's social system that determines whether the individual is retarded. Most mentally retarded children, particularly those, who are higher functioning, do not "officially" become retarded until they enter the school. It is because the school as a social system has a certain set of expectations some children do not meet. This unit deals with mentally retarded children. The causes and degrees of mental retardation are described. Also, the educational provisions for mentally retarded children are outlined.

8.2. OBJECTIVES

After reading this unit, the readers should be able to:

1. Define mental retardation
2. Understand the causes and degrees of mental retardation.
3. Identify mentally retarded children.
4. Develop an insight into the educational considerations of mentally retarded children.
5. Teach students with mental retardation in general education classroom.

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8.3. DEFINITION OF MENTAL RETARDATION

Mental retardation refers to significantly sub average intellectual functioning resulting in or associated with impairments in adaptive behaviour and manifested during the developmental period. This definition indicates that a person must be well below average in both measured intelligence and adaptive behaviour to be classified as retarded. At one time mental retardation was diagnosed on the basis of an IQ below 65. But today they must have deficits in adaptive behaviour and an IQ below 75 or 70. Mental retardation need not be a life-long condition, especially for those whose degree of retardation is relatively mild. Furthermore, early educational programming can prevent some children from being diagnosed so.

Adaptive Behaviour

Adaptive behaviour plays a vital role in determining whether a person is retarded. Some children may score low on a standardised intelligence test, but have adequate adaptive skills. Some children may function in the retarded range while they are in school for six hours of the day but they may behave normally adjust and adapt competently once they return to the home community for the other eighteen hours. Adaptive behaviour encompasses more than the ability to survive outside school. They are different for the pre-schooler and adult. In infancy and early childhood, sensory-motor, communication, self-help, and socialisation skills are important. In middle childhood and early adolescence, learning abilities and interpersonal social skills are important. In late adolescence and adulthood, vocational skills and social responsibilities are important.

Intellectual Functioning

The words "sub average general intellectual functioning" in the definition refer to scores more than two standard deviations below the mean on a standardised test of intelligence. One commonly used IQ is the Wechsler intelligence Scale for Children - Revised (WISC-R). On this text, a score of 70 would be two standard deviations below the mean, or average, of 100. The score of seventy may be treated as a guideline but a cut off of 75 may be warranted in some cases.

8.4. DEGREES OF MENTAL RETARDATION

Most professionals classify mentally retarded individuals according to the severity of their problems. The most generally accepted approach is to classify on the basis of a continuum or scale of severity. The two most common systems of classification are that of the American Association on Mental Retardation (AAMR) and the one used by educators.

The AAMR Classification

The AAMR classifies mental retardation as mild, moderate, severe, and profound retardation. This classification is made on the basis of IQ range.

Mild Mental Retardation (l Q. 50-55 to 70)

Those individuals who possess IQs between 50-55 and 70 are diagnosed as having mild mental retardation. About 90 percent of mentally retarded people belong to this category. The persons in this group are educable. They evince an organic pathology and require little supervision. With parental assistance and special training, they can be taught to be self-supporting.

Moderate Mental Retardation (IQ. 35-40 to 50-55)

Those individuals who possess IQs between 35-40 and 50-55 are diagnosed as having moderate mental retardation. About 6 percent of the mentally retarded people belong to this category. These individuals are trainable retardates. Their rate of learning is very slow. Physically they appear clumsy and lack motor coordination. Though some of them may require institutionalisation, they can manage to live safely under the protection of their family members.

Severe Mental Retardation (IQ 20-25 To 35-40)

Those individuals who possess IQs between 20-25 and 35-40 are diagnosed as having severe mental retardation. About 3 percent of the mentally retarded people belong to this category. These individuals are considered dependent retarded. These persons suffer from severe retardation in motor and speech development. Majority of them are permanently institutionalised and require constant care and attention. They can perform simple occupational tasks under supervision.

Profound Mental Retardation (IQ Below 20-25)

Those individuals who possess IQs below 20-25 are diagnosed as having profound mental retardation. About 1 percent of the mentally retarded people belong to this category. They are considered "life support" mental retardates. These persons are severely deficient in adaptive behaviour and unable to do simple tasks. Retarded growth, pathology of central nervous system, mutism, deafness and convulsive seizures are common symptoms of these people. They are unable to look after themselves. They cannot attend to their basic physical needs. They need lifelong support.

Educators' Classification

Educators classify mental retarded children as educable mentally retarded (EMR), trainable mentally retarded (TMR), and Custodial mentally retarded (CMR).

Educable mentally Retarded (EMR) individuals are those who possess IQs between 75-70 and 50. More and more school systems are now using 70, whereas previously they used 75.

Trainable Mentally Retarded (TMR) individuals are those who possess IQs between 50 and 25.

Custodial mentally retarded (CMR) individuals are those who possess IQs below 25

The terms "educable'" and "trainable" have survived over the years among educators because they. describe, albeit grossly, the educational needs of retarded children. In general, children classified as EMR can learn some basic academic subjects. The curriculum for the children Classified as

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TMR, on the other hand, concentrates more on functional academic subjects, with emphasis on self-help and vocational skills.

8.5. CAUSES OF MENTAL RETARDATION

Many authorities are of the opinion that it is not possible to pinpoint the cause of mental retardation in only about 6 to 15 percent of the cases. Although, there is some overlap, the causal factors for mild retardation differ from those for more severe levels of retardation.

Causes of Mild Retardation

Most individuals identified as retarded are classified as mildly retarded. They do not differ from their non-handicapped peers in appearance. They are usually not diagnosed as retarded until they enter school where they begin to fall behind in schoolwork. In addition, in the vast majority of the cases it is not possible to specify the exact cause of retardation. Many professionals believe that the following factors cause mild retardation.

1. Mildly retarded individuals often have cultural familial retardation, which is regarded as a vital causative factor.
2. Genetic factors also cause mild retardation, though they play a vital role in severe retardation.
3. Environmental factors cause mild retardation. Environmental factors presumably cause retardation because they produce such effects as inadequate learning opportunities and poor nutrition. Which causes more retardation heredity or environment has been the subject of debate for years.

Causes of Severe Retardation

Causes of retardation in individuals classified as moderately retarded and profoundly retarded can more easily be determined than the causes of retardation in individuals classified as mildly retarded. Causes for more severe retardation can be divided into two general categories such as genetic factors and brain damage.

i) **Genetic Factors**

There are a number of genetically related causes of mental retardation. These are, generally, of two types those that result from some damage to genetic material, such as chromosomal abnormalities, and those that are due to hereditary transmission. Genetic factors include three conditions such as Down Syndrome, which results from chromosomal abnormality, and PKU (Phenylketonuria) and Tay-Sachs disease, both of which are inherited.

Down Syndrome accounts for approximately 10 percent of all moderate and severe cases of retardation. Down syndrome is sometimes, though less acceptably, referred to as mongolism because of the facial characteristic of thick epicanthal folds in the corners of the eyes, making them appear to slant upward slightly. Other common physical characteristics include small stature; decreased muscle tone (hypotonia); hyper flexibility of joints; speckling of the iris of the eye; small oral cavity, which results in protruding of the tongue; short and broad hands with a single palmar crease;

and a wide gap between the first and second toes. Researchers are coming close and closer to discovering the exact gene or genes that cause Down Syndrome.

PKU (Phenylketonuria) involves the inability of the body to convert a common dietary substance phenylalanine to tyrosine. Accumulation of phenylalanine results in abnormal brain development. Babies can undergo a screening test for PKU in the first few days after birth. Unless a baby with PKU starts a special diet controlling the intake of phenylalanine in infancy and continues it into middle childhood, the child will usually develop severe retardation. If the diet is stopped at middle childhood a decrease in IQ may occur. So many authorities stress that the diet should be maintained indefinitely, PKU occurs when the parents are carriers of PKU genes.

Tay-Sachs disease, like PKU, can appear when both mother and father are carriers. It results in progressive brain damage and eventual death

Brain Damage

Brain damage causes severe mental retardation. As it can result from a host of factors that fall into two general categories infections and environmental hazards.

Infections

Infections that may lead to mental retardation can occur in the mother to be or the infant or young child after birth. Rubella, (German measles), syphilis, and herpes simples in the mother can all cause retardation in the child. Rubella is dangerous during the first three months pregnancy. The venereal diseases, syphilis and herpes simples present a greater risk at later stages of foetal development. These diseases cause brain damage, which, in turn, result in mental retardation.

There are three examples of infections of the children that can affect mental development. They are meningitis encephalitis, and paediatric AIDS.

Meningitis is an infection of the covering of the brain that may be caused by a variety of bacterial or viral agents.

Encephalitis is an inflammation of the brain, which results more often in retardation and usually affects intelligence more severely.

Paediatric aids are the fastest growing infections cause of mental retardation. In fact, researchers indicate that it may soon become the leading cause of mental retardation and brain damage. Research studies project that the vast majority of children with paediatric AIDS have got their infection during birth from their mothers, who used intravenous drugs or were sexually active with infected men.

Environmental Hazards

Environmental hazards that can result in mental retardation are a blow to the head, poisons, radiation, malnutrition, prematurity or post maturity, and birth injury. These can result in mild retardation in some cases. But in most cases, these environmental hazards cause severe mental retardation.

A blow to a child's head can result in mental retardation. Child abuse is a cause of brain damage that results in mental retardation and other disabilities.

NOTES

Poisoning resulting in mental retardation can occur in the expectant mother or in the child. The recent studies have brought to light the harmful effects of a variety of substances, from obvious toxic agents such as cocaine and heroin to more subtle potential "poisons" such as tobacco, alcohol, caffeine and even food additives. Especially, the pregnant women who smoke and/or consume alcohol have a greater risk of having babies with behavioural and physical problems.

Radiation is another hazard to the unborn foetus. Pregnant women should not be exposed to x-rays unless absolutely necessary. There are potential dangers of radiation from improperly designed or supervised nuclear power plants.

Improper nutrition also causes mental retardation. When the expectant mother is malnourished or when the child once born does not have a proper diet, retardation occurs.

Abnormal length of pregnancy either too short (prematurity) or too long (post maturity) can also result in mental retardation. The latter is not likely to cause retardation but it is possible that the foetus will suffer from poor nutrition, if it is long overdue. Both premature and small (underweight infant) suffer from physical or behavioural abnormalities including retardation. Poor nutrition, teenage pregnancy, drug abuse, and excessive cigarette smoking are some causative factors of prematurity.

Check your Progress -1

Note a. Write your answer in the space given below.

b. Compare your answer with those given at the end of the unit.

1. Define the term ‘mental retardation’.

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2. How will you classify the mentally retarded children.

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8.6. CHARACTERISTICS OF MENTALLY RETARDED CHILDREN

There are various psychological and behavioural characteristics associated with mentally retarded children. But it cannot be said with certain that each mentally retarded child will display all the characteristics mentioned. There is a great deal of variability in the behaviour of retarded children. Each retarded person is a unique and separate individual. The characteristics of mentally retarded children are classified into two types as cognitive characteristics and personality characteristics.

Cognitive Characteristics

The most obvious characteristics of mentally retarded children is their reduced ability to learn There are quite a number of ways in which mentally retarded children exhibit cognitive problems. Research has

documented four areas in which the mentally retarded children are likely to have difficulties. The four areas are attention, memory, language, and academics.

Attention Deficit

The importance of attention for learning is critical. Children must be able to attend to the task at hand before they can learn it. Many of the problems of mentally retarded children can be attributed to attention problems. They often attend to the wrong things and they experience difficulty in allocating their attention properly. Mentally retarded children have less attention to allocate to different processes and they cannot efficiently assign the proper amount or quality of attention to the various aspects of a task.

Poor Memory

Researchers have posited that mentally retarded children do more poorly than the non-disabled children when asked to remember a list of words or sounds or group of pictures presented a few seconds earlier. This can be ascribed to their poor processing of information. Depth of processing is very essential to remember certain material. Research has demonstrated that the deeper the level of processing is required, the greater the memory problems the mentally retarded children will have. In other words, the more complicated the memory task is, the more likely the retarded children will have difficulties with it.

One of the primary reasons for mentally retarded children to have problems on more complicated memory tasks is that they have difficulty in using efficient learning strategies. Many authorities have attributed mentally retarded children's inefficient use of learning strategies such as rehearsal and clustering to the fact that their executive control processes are less well developed.

But even though retarded children are deficient in the spontaneous use of learning strategies and executive control processes, they can be taught to use such processes successfully.

Inadequate Language Development

Many mentally retarded children have language and speech problems, for example, articulation errors. The greater the degree of retardation is, the more severe the difficulties are. In general, the language of mentally retarded children, especially those classified as mildly retarded, follows the same developmental course as that of non-retarded children. However, the language development progresses at a slower rate. The severely retarded children exhibit inadequate language development.

Poor Academic Performance

As there is a strong relationship between intelligence and achievement, it is not surprising that may retard students lag behind their non-retarded peers in all areas of achievement. They also tend to be underachievers in relation to expectations based on their intellectual level.

Their learning depends more on rote memory than on understanding. They are found to repeat the errors again and again. They face difficulties in engaging in abstract and critical thinking, employing critical judgement,

avoiding errors, and in exercising foresight. All these factors contribute to their poor academic performance.

Personality Characteristics

Mentally retarded children display certain unique personality characteristics. Some of them are briefly discussed below.

Social and Emotional Inadequacy

Mentally retarded children evince social and emotional problems especially; they experience problems in making friends, and have poor self-concepts. There are two reasons why they are so. First, some of their behaviour may "turn off' their peers. For example, mentally retarded children engage in higher rates of in attention and disruptive behaviour than their non-retarded classmates. Second, their non-retarded classmates may despise them, as they do not want to have any association with individuals who are retarded. As a result, the mentally retarded children encounter problems in social interaction with others.

Lack of Motivation

In addition to social emotional problems, mentally retarded children exhibit motivation problems. These children tend to lack confidence in their own abilities. They believe that they have little control over what happens to them. They also think that they are primarily controlled by other people or events. As such, they have a tendency to give up easily when faced with challenging tasks.

Limited Individual Differences

It is a known fact that no two individuals in this world have the same personality. But in case of mentally retarded children, there appear to be less prominent individual differences. These children do not exhibit such marked individual differences as non-retarded children do. Among the retardates, it is rare to find individuals who may be described as dynamic, charming, forceful, vicious, obnoxious or outstanding. Many mentally retarded children are colourless and tractable.

Organismic Inferiority

Mentally retarded children suffer from general structural and functional inferiority of the entire organism. These children learn to talk and walk at a much later stage. Defective speech and shuffling gait are two very prominent characteristics of these children.

When compared with their non retarded peers, their sensory discrimination is less acute. The retardates are relatively insensitive to pain and their auditory and visual defects are common. It is very rare to find normal performance among mental retardates, who fall short of normal performance on tests of mechanical ability.

Adjustment Problem

Mentally retarded children experience mild depression, feelings of worthlessness and helplessness. As these children grow older, they become lonely and unable to adjust in society. Research evidence indicates that frustration of psychological and social needs predisposes some retarded

children to feel angry and rebellious Very often, the parents of mentally retarded children develop a guilt complex. Parental overprotection is a good example for this. Often, they do not encourage self-help; rather they continue to dress and feed the child up to an advanced age. Consequently, this type of behaviour fosters a dependent style of interaction in the retardates. Thus, over protection and denial of the parents result in adjustment difficulties of such type of children.

8.7. EDUCATION OF MENTAL RETARDATES

Although there is some overlap, in general the focus of educational programmes varies according to whether the children are mildly, moderately, or Custodial mentally retarded. For example, the lesser the degree of retardation, the more the teacher emphasises academic skills, and the greater the degree of retardation the more stress there is on self-help, community living, and vocational skills. It should be remembered that this distinction is largely a matter of emphasis. In actual classroom practice, all teachers of retarded students need to teach academic, self-help, community living, and vocational skills irrespective of the severity levels of their students. A brief description of the major features of educational programmes for educable mentally retarded, trainable mentally retarded and Custodial mentally retarded children is presented below.

8.7.1. Education of Educable Mentally Retarded

Researchers are of the opinion that educable mentally retarded children tend to fail in an ordinary school. Nevertheless, they are capable of making progress in normal schools. The schools should provide them with such curriculum and methodology of teaching that will enable them to surmount their difficulties easily. It should be the first priority of the teacher to help the mentally, retarded children to become self-sufficient and an accepted adult member of the community in which he lives. The special methods adapted in teaching the educable mentally retarded are as follows:

Individualisation

Individualisation of education is obviously the dominant theme that comes to mind when we think of special methods of instructing the educable mentally retarded children. Individualisation of education does not mean that children receive individual instructions with small classes, but it implies that each child is allowed to proceed at his own pace of learning according to his own unique growth pattern. At the same time, these children must be provided with opportunities for group participation so that correct social attitudes can be developed in them.

Learning by Doing

The implication of the principle of learning by doing cannot be underestimated in teaching the educable mentally retarded children. The basic principle of special education has always been that the children should learn by doing. Teachers should give top priority to activity methods that lay emphasis on learning through experience. Generally, the deficiency of

NOTES

mentally retarded children lies in the area of relational and abstract thought. So, these children encounter problems in learning where the mode of communication is largely verbal. It has been posited that these children learn better through such materials that appeal most to their senses.

Need for Learning Readiness

While introducing academic work to mentally retarded children, teachers should give due importance to the concept of maturation and readiness to learn. These children have the potential to learn to read, but they should be prepared through appropriate readiness programmes. It is always rewarding to wait until the children are intellectually and psychologically ready to accept the challenging task.

Graded Curriculum

These is no denying that these retarded children learn more slowly than average children. It warrants careful gradation of subjects. It poses problems for the teachers who have to shoulder the responsibilities of grading the curriculums and preparing the study materials for them. It is, no doubt, a tough task for the already overburdened teachers, but not an impossible task.

Repetition

Mentally retarded children are known for poor memory. For them, teaching method must provide for a considerable amount of repetition so that they can retain the learned material in their memory.

The children should have clear understanding of the materials before facing any retention test. The memory span of these retarded children can be enhanced by imbibing in them interest and motivation. Research studies have posited that the memory span of retarded children, increases, if the learning materials have meaningful associations.

Periods of Short Duration

Mentally retarded children cannot concentrate on a subject for a longer time. They have limited power of concentration. They cannot concentrate on them for more than 20 minutes or so. For this reason, formal teaching periods should be fairly short. It is of prime importance to consider how long children can concentrate when the subject is stimulating. Modular instruction with appropriate teacher support system will be very effective for retarded children.

Concrete Problems

There is no doubt that mentally retarded children lack imagination and foresight. As a result, they experience considerable difficulty in transferring the learning experience of one situation to another situation that is similar but new. To overcome this problem, they need concrete presentation of instruction. Real life problems should be introduced whenever possible so that the teachers can ensure immediate application of learning experiences.

Projects

'Introduction of projects" or "centres of interest" is a significant approach for teaching mentally retarded children. Researchers are trying to establish how this can be done without serious disruption of the basic subject programme. It is not the teachers who should introduce the topics around which centres interest grow and develop but it is the topic that should arise spontaneously out of the class room situation. Where the manifestation of further information is clear. The point of origin may be a short story, a poem, a song, a film or picture in a magazine or newspaper. It is not necessary to give under importance to the source, but it requires expertise on the part of the teacher to present it through careful planning and guidance.

8.7.2. Education of Trainable Mentally Retarded

The trainable mentally retarded children have I.Q in the range of 25-50. These children are much more retarded than educable mentally retarded children. So, it is important to frame a different educational structure and curriculum for these children. The main objective of education for these children is to enable them to take care of themselves and to do simple occupational jobs. These children have prominent physical anomalies such as seizures, lack of control over elimination etc.

It makes regular schooling difficult for these children. So primary objective should be to these retarded children how to do their daily work without the help of others. These daily works include working, dressing themselves eating properly, doing simple jobs and toilet training etc.

In the education of trainable mentally retarded children less importance is given to teaching of academic subjects and more time is devoted to the development of sensorimotor, self-care, and daily living skills. As these children become tired very soon, a more definite timetable is necessary with short periods of activity. Therefore, the curriculum for the trainable mentally retarded children should include the following.

i) Self-Care

The curriculums should focus on a programme of simple habit training. This will enable those children to develop skills of self-help with regard to their daily practical needs. Teachers should adapt such methods for this purpose that relate to the real-life experiences and everyday needs of the children.

ii) Social Training

Teachers of these children should give priority to group activities such as games, simple dramatic work, and storytelling etc. This will enable them to interact with others, which is essential for socialisation. This will also increase gregariousness and affiliation. The children become generally active and cooperative. This provides training in adjustment also.

iii) Sensory Training

Teachers should lay much emphasis on such instructions that will enable the retarded children to make the fullest use of their senses. This is very required to make them self-reliant and more sociable. Proper sensory

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training will contribute to the development of social skills in these retarded children.

iv) Language Development

Teachers should provide them with such aids that will ensure better speech development in them. The degree of their socialisation depends on the degree of their language development. They should be able to follow directions and interact with peers in group situation. These children should be taught reading in order to enable them to function independently.

v) Craft Work and Music

For developing a sense of self-confidence in trainable mentally retarded, the curriculum should include simple crafts training programmes like weaving, rug making, basketing etc. This will enable these children to attain economic self-sufficiency in adulthood. Research evidence has brought to light that music is sometimes found as a means of releasing their energy and provides a form of expression, which the mentally retarded children enjoy. So, music should be given appropriate importance in the curriculum.

8.7.3. Education for Custodial Mentally Retarded Children

Most authorities agree that the following features should characterise the educational programmes for Custodial mentally retarded children.

i) Age-appropriate curriculum and materials
ii) Functional activities
iii) Community based instruction
iv) Integrated therapy
v) Interaction with non-retarded peers
vi) Family involvement

Age-Appropriate Curriculum and Materials

In the past there was a tendency to "baby" even older Custodial mentally retarded persons because of their intellectual limitations. Authorities are of the opinion now that this is not only demeaning but also educationally harmful. Using infantile materials works against the goal of fostering as much independent behaviour as possible. So, the curriculum and the instructional material must be appropriate to the age of the students.

Functional Activities

Educational programmes for Custodial mentally retarded children focus on preparing them to live as independently as possible so much, that activities should be practical. Learning to dress oneself by practising on a doll, for example, is not as effective as practising with one's own dress. Some Custodial mentally retarded children may be able to learn some academic skills. Teaching these children basic reading and math is very time consuming. It is, therefore, very important to teach them only what they will need and what they can learn.

Community Based Instruction

In keeping with the notion of functional skills, educational programmes for Custodial mentally retarded children need to take place in the community as much as possible. Because many of the skills they learn are for use in settings outside the classroom, such as public transportation, or the grocery store, instruction in such activities has proved more effective when done in those settings. The teacher may wish to use simulated experiences in the classroom, by creating a "mini-grocery" store with a couple of aisles of products and a cash register, for example, to prepare students before they go to a real store. But such simulations themselves will not be of much use for custodial mentally retarded children who very much need the actual experience of going into those settings in which they will need to use the skills they are learning.

Integrated Therapy

Many Custodial mentally retarded children have multiple disabilities that necessitate the services of a variety of professionals, such as speech, physical and occupational therapists. Many authorities are of the opinion that these professionals should rather integrate what they do with students into the overall educational programme than doing their job alone in a therapy room. For example, they point out that it would be better to teach retarded children how to walk up and down the actual stairs in the school they actually attend instead of using the specially made stairs placed in therapy rooms for this purpose.

Interaction with Non-Disabled Students

Most authorities concur that it is beneficial for both Custodial mentally retarded children and their non-retarded peers to interact. One method used by some schools is to engage non-disabled students to act as tutors or classroom helpers in classes for Custodial mentally retarded students. This interaction facilitates normalisation or socialisation of retarded students.

Family Involvement

Research findings point out that family involvement is very essential for the success of educational programmes for disabled students of all types and severity levels. It is particularly very important for Custodial mentally retarded students. It is because many of the skills they are taught in the classroom will be used in their homes. The involvement can range from merely informing parents about the progress of their children to having them out as classroom aids.

Using Applied Behaviour Analysis to Teach Retarded Children

Applied behaviour Analysis is effectively used with all types of disabled students, but it is particularly of much value to teach retarded students, especially those with more severe learning problems. Applied behaviour analysis is the application and evaluation of principles of learning theory in teaching situations. It consists of six steps (see Table)

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Table: APPLIED BEHAVIOUR ANALYSIS TEACHING MODEL

Step	Procedure	Example 1	Example 2
1.	Identify overall goals by using broad problem statements.	Laura is behind in her math skills.	Lorenzo has trouble staying in his chair.
2.	Gather specific information about the problem.	Laura can add single digit problems with sums to 10, but cannot carry.	Lorenzo gets out of his seat an average of 15 times per hour.
3.	Specify learning objectives.	Laura will add numerals with sums to 30 at a rate of at least 5 correct solutions per minute.	Lorenzo will stay in his seat for at least 10 minutes before getting up.
4.	Plan and Implement Intervention Programme.	Drill and practice first on sums to 20, no carrying required, then teacher instruction and modelling for carrying procedure. Bonus free choice during recess for 90% correct or better on daily work sheets.	Lorenzo loses 5 minutes of recess each time he gets out of his seat without permission.
5.	Monitor Student Performance.	Teacher keeps daily record of accuracy on worksheets. Every Friday teacher conducts a 1-minute timing to determine rate of performance.	Teacher counts Lorenzo’s out of seat behaviour during routinely selected periods, for a total of 20 minutes of observation per day.
6.	Evaluate Student Performance.	Teacher charts accuracy and speed data weekly and uses information to decide whether or not a change is necessary.	Teacher keeps a daily chart of out of seat behaviour. If Lorenzo goes 3 days without any improvement, she makes a change in consequences.

First, the teacher identifies the overall goal, this is usually a skill area the student needs more work in or an inappropriate behaviour that he needs to decrease. Second, further information is obtained on the identified skill area or behaviour by taking a baseline measurement. The baseline measurement indicates at what level the student is currently functioning. The teacher can later compare the student's performance after instruction with the original, baseline performance. Third, the teacher decides on a

specific learning objective; that is, the teacher breaks down the overall goal into specific skills the child is to learn. Fourth, the teacher implements an intervention designed to increase needed skills or decrease inappropriate behaviour, for example, a drill and practice routine for math problems or a reward system for good behaviour. Fifth, the child's progress is monitored by measuring performance frequently, usually daily. Sixth, the teacher evaluates the effects of the intervention, usually by charting the student's performance during intervention and comparing it with the baseline performance. Based on this evaluation, the teacher decides whether to continue, modify, or end the intervention.

Check your Progress -2

Note a. Write your answer in the space given below.

b. Compare your answer with those given at the end of the unit.

3. State the characteristics of mentally retarded children.

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4. As a special educator, what methods will you adopt in teaching educable mentally retarded children

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8.8.TEACHING RETARDED CHILDREN IN GENERAL EDUCATION CLASSROOM

What to look for in school

Children with moderate and severe and profound mental retardation can be identified even before they enter the school, but the children who are mildly retarded can be identified during the school years. Like learning disabled students, mildly retarded children also experience considerable difficulties in attention, language and memory. For example, these retarded students find it very difficult to begin assignments properly and to stay on task. ASIO, they develop motor, language, social and independent skills more slowly than most students in their class. Moreover, those mildly mentally retarded children have short-term memory problems and they do not know how to use learning strategies that their non-disabled peers seem to use spontaneously.

Furthermore, these mildly retarded students usually experience difficulty in learning in all academic areas, and their rate of skill acquisition is much slower than their non-disabled peers. However, teachers can adopt certain teaching techniques so as to help these retarded children master many of the concepts and skills presented in elementary school.

To achieve this goal, the teachers should

- Divide learning materials into small segments or steps.

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- Carefully sequence these steps from simplest to most difficult.
- Use concrete examples and experiences to teach concepts.
- Teach learning strategies
- Provide much drill and practice to promote mastery
- Give consistent feedback and reinforcement.

Teaching Techniques to Try

In addition to applied behaviour analysis discussed earlier in this chapter, teachers can try peer tutoring technique, reverse mainstreaming technique and modular instruction, with active teacher support system.

Peer Tutoring

Mentally retarded children in a large heterogeneous class need repeated practice and individual help. To provide practice and adequate help, teachers can make use of tutoring, a technique that under certain conditions have been shown to benefit both tutor and tutee academically, behaviourally, and socially. In peer tutoring programmes teachers typically provide instruction to all class members. Then the students in the class (peer tutors) or older students (cross age tutors) who have mastered the learning are engaged to assist those students in need of additional instruction and practice during regularly scheduled tutorial sessions. Tutors have to perform many tasks such as reviewing lessons, directing and monitoring the performance of newly learned skills, and providing feedback and reinforcement. It is the duty of the teachers to plan, supervise and evaluate a peer tutoring programme.

Reverse Mainstreaming

Another educational arrangement in which students help other students is reverse mainstreaming. This programme involves a few non-disabled students participating in some of the activities conducted in special education classrooms. Their participation helps disabled students learn appropriate behaviours such as social and language skills while promoting within the non-handicapped children an awareness of special education students and classes. Teachers select non-disabled student volunteers who demonstrate socially appropriate behaviours. After providing them with adequate training and information about special needs children, teacher engages them on tutoring task. In one reverse mainstreaming programme, Project Special Friend, volunteers interacted with severely retarded children. The programme was quite successful in imbibing in retarded children appropriate behaviours.

8.9. LET US SUM UP

Mentally retarded children are those who suffer from the impairment of their general intellectual functioning along with deficits in adaptive behavior to such an extent that they need appropriate environmental support over a substantial period for actualizing their potential and improving their life functioning. Proper identification of mentally retarded children may help in classifying them. All genuine efforts should be made for the prevention of mental retardation. Educational efforts need the proper follow up, cooperation and help from the parents, people of the community,

government and voluntary organizations working in the field of education, treatment and rehabilitation of the mentally retarded individuals particularly the general attitude towards the mentally handicapped needs to be changed. Their education or training should begin at home. Thereafter special schools may be involved in their education and training.

8.10. UNIT – END EXERCISES

1. Explain the causes of mental retardation
2. Explain the different types of mental retardation.
3. How would you apply 'applied behavior analysis to teach mentally retarded children?
4. Explain the salient features of educational programmes to the severely retarded children
5. Describe the technique that you would adopt to teach retarded children.

8.11. ANSWERS TO CHECK YOUR PROGRESS

1. Mental retardation refers to significantly sub average intellectual functioning resulting in or associated with impairments in adaptive behaviour and manifested during the developmental period.
2. The AAMR classifies mental retardation as mild (IQ 50-55 to 70), moderate (35-40 to 50-55), severe (IQ 20-25 to 35-40), and profound retardation (IQ below 20-25). This classification is made on the basis of IQ range. Educators classify mental retarded children as educable mentally retarded (IQ between 75-70 and 50), trainable mentally retarded (IQ between 50 and 25), and Custodial mentally retarded (IQ below 25).
3. Cognitive characteristics – attention deficit, poor memory, inadequate language development and poor academic performance. Personality characteristics – social and emotional inadequacy, lack of motivation, organismic inferiority and adjustment problem.
4. Individualization**,** learning by doing, need for learning readiness, graded curriculum, repetition, periods of short duration, concrete problems, and projects.

8.12. SUGGESTED READINGS

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BLOCK – III: GIFTED CHILDREN

UNIT IX – GIFTED AND CREATIVE CHILDREN

STRUCTURE

9.1. INTRODUCTION

This unit deals with concept of gifted children, their characteristics, identification and education for gifted children. It also deals with concept of creativity, how to identify creative children through suggested direct and indirect assessments and nurturing creativity among children. The mastery over the contents of this unit would help the readers to have a better understanding of gifted and creative children. It would be more useful for those in teaching profession to identify giftedness and creativity and promoting their capabilities through appropriate educational measures.

9.2. OBJECTIVES

After reading this unit, the readers shall be able to:

- Develop an insight into the concept of giftedness.
- Understand the characteristics of gifted children.
- Identify gifted children in the classrooms.
- Define creativity.
- Identify Creative Children.
- Devise instruction for gifted children.

9.3. GIFTED CHILDREN

People who have special gifts, or at least have the potential for gifted performance, may go through life unrecognised. Similarly, sometimes gifted children and youths are not discovered as their families and close associates do not give much importance to their special abilities. Lack of opportunities or training also does not bring them to light. Especially, when the students belong to poor families or minority groups, they may be deprived of chances to demonstrate and develop their potential. We would have more outstanding artists and scientists if every talented child had the opportunity and the training necessary to develop his or her talents to the fullest possible extent. Most of us feel it a moral obligation to help those who are at some disadvantage compared to the average person but we don't feel like so to help gifted children become better. It is on this issue the desirability and dire necessity of helping one most capable child become even better that special education for gifted children is likely to founder.

9.3.1. Definition of Gifted Children

Children with special gifts are very superior to a comparison group of other children of some age. Beyond this simple statement there is little agreement about how giftedness should be defined. The disagreements are due primarily to differences of opinion regarding the following questions:

1. In what way are gifted children superior?
2. How is superiority measured?
3. To what degree must a child be superior to be considered gifted?
4. Who should make up the comparison group?

Even the terminology of giftedness is rather confusing. Besides the word "gifted", there are a variety of other terms used to describe individuals who are superior to other children. Such terms are talented, creative, insightful, genius and precocious.

Precocity refers to remarkable early development. Many highly gifted children manifest precocity in particular area of development, such as, language, music, or mathematical ability. The rate of intellectual development of all gifted children exceeds that of non-gifted children.

Insight may be defined as separating relevant from the irrelevant information, finding novel and useful ways of combining relevant bits of information, or relating old and new information in a novel and productive way.

Genius indicates a particular aptitude or capacity in any area. More often, it is used to indicate extremely rare intellectual powers such as extremely high I.Q. or creativity.

Creativity refers to the ability to express novel and useful ideas, to sense and elucidate novel and important -relationships, and to ask previously un thought of, but crucial questions.

Talent is a word ordinarily used to indicate special ability, aptitude or accomplishment.

Giftedness refers to cognitive (intellectual) superiority (not necessarily of genius caliber), creativity and motivation in combination and of sufficient magnitude to set the child apart from the vast majority of age mates. These qualities make it possible for gifted children to contribute something of particular value to society.

The traditional definition of giftedness is based on general intelligence test, usually the Stanford Binet, or the Wechsler Intelligence Scale for children Revised. That is, children had traditionally been considered gifted if they scored above a particular level on the Binet or the WISC-R,. According to traditional definition, the gifted children are those children whose potential intellectual powers are at a high educational level in both producing and evaluative thinking.

More recently giftedness is conceptualised - in terms of developmental model. Giftedness may be thought of as a superior to extraordinary developmental outcome resulting from the joint function of a relatively unimpaired and invulnerable organism and a facilitative environment. That is, children can attain a gifted level of performance only when they are (1) relatively free of biological impairments, (2) mostly invulnerable to environmental stresses that tend to limit performance, and (3) reared in an environment that supports performance.

Gifted children can be defined for purposes of education as those children who demonstrate or manifest potential for high ability including high intelligence, high creativity and high task commitment. The reason for using the multiple-criterion definition is that all these three characteristics-high ability, high creativity and high task commitment-seem to be very necessary for truly gifted performance in any field.

9.3.2. Origin of Giftedness

It is not surprising that brilliant parents are more likely to have gifted children than the parents of average of retarded intelligence. It is a known fact that an impoverished environment is less likely to produce gifted children. There may be a few exceptions. Some children of intellectually dull parents may be gifted despite their environmental disadvantages.

But the statistical evidence indicates that giftedness increases when the child's parents have higher than average intelligence and provide a better than average environment for the child. The origins of giftedness are not fully understood. Well-designed research works need to be undertaken to discover the relative contribution of genetic and environmental factors to giftedness and the precise nature of the genetic and environmental factors that contribute to giftedness.

Genetic and Other Biological Factors

The proposition that intelligence and highly valued skills are inherited is not a very popular one in our egalitarian society. The fact that giftedness is partly inherited, irrespective the definition proposed, should not be taken as an indication that environmental factors are unimportant. Genetic influences on the development of superior abilities cannot be denied, but these biological influences are clearly no more important than the environments in which the children are nurtured.

Biological factors that are not genetic may also contribute to the determination of intelligence. For example, nutritional and neurological factors may to some extent, determine how intellectually competent a child becomes. Severe malnutrition in infancy or childhood, as well as neurological damage at any age, can result in mental retardation. At the same time, it is wrong to assume that superior nutrition and neurological status early in life alone can contribute to superior intelligence.

It may be stated that genetic factors are clearly involved in the determination of giftedness. Environmental factors alone cannot account for giftedness of children. It is to be noted that an individual does not inherit an IQ or talent. What is inherited is a collection of genes that along with experiences determine the limits of intelligence and other abilities.

Environmental Factors

There is no doubt that families, schools, communities obviously exercise a profound influence on the development of children's abilities. Stimulation, opportunities, expectations, demands, and rewards for performance affect children's learning. Research works have established that there is a correlation between socio economic level and IQ. Influences of home and families, especially in the child's younger years, are extremely important. The following were found to occur in the families of highly successful persons.

Someone in the family, usually one of the parents, had a personal interest in the child's talent and provided great support and encouragement for its development.

There was specific parental encouragement for the child to explore, to participate in home activities related to the area of developing talent, and to join the family in related activities. Small signs of interest and capability by the child were rewarded.

Expected behaviours and values related to the talent were present in the family. Clear schedules and standards for performance appropriate for the child's stage of development were held. The family interacted with the tutor/mentor and received information to guide the child's practice.

Parents observed practice, insisted that the child put in the required amount of practice time, provided instruction where necessary, and rewarded the child whenever something was done especially well or when a standard was met.

Parents encourage participation in events such as recitals, concerts, contests, etc. in which the child's capabilities were displayed in public.

We may conclude that children who realise their potential for accomplishment will have families that are stimulating, directive, supportive and rewarding of their abilities. Also, the ways in which the schools identify giftedness, group children for instruction, design curricula, and reward

performance have a profound effect on what the most able students achieve. Furthermore, striving for upward social mobility and the high value attached to achievement in specific area among certain cultural and ethnic groups also contribute to giftedness.

In summary, it may be stated that environmental influences have much to do with how a child's genetic endowment is expressed in performance. But neither environment nor genetics can be entirely responsible for the performance of gifted or retarded individuals. It is the genetic factors that apparently determine the range within which a person will function, and it is the environmental factors that determine whether the individual will function in the lower or upper reaches of that range.

9.4. CHARACTERISTICS OF THE GIFTED CHILDREN

There is no doubt that gifted children exhibit their talents by their remarkable performance in any task undertaken by them teachers can easily identify these children by keenly observing their performance. A number of misconceptions are found among laymen regarding their physical stature and social adjustment. Recent researchers have thoroughly studied groups of gifted children and they outline the following as the common characteristics of gifted children.

Physical Characteristics

Gifted children as a group are taller, heavier, stronger, more energetic, and healthier than other children of their age who have average intelligence. It is wrong to assume that all gifted children are physically weak, small, and sickly. Many gifted children have been outstanding in athletic ability and superior competitors in a variety of sports. There are two things to be noted here. First, although the gifted children clearly tend to excel their average age mates in both mental and physical characteristics by the time, they are several years old, it is not easily possible to detect their superiority at birth or even during the first year in most cases. Second, since there is a correlation between IQ and socioeconomic status, the apparent physical superiority of gifted children may be a result of non-intellectual factors.

Educational Characteristics

Gifted children tend to be far ahead of average children in academic achievement. They learn to read very easily. Many of them are taught to read by parents or teach themselves before they enter school. Many of them are more advanced in reading than in areas that require manual dexterity, such as writing, art. They are more advanced in reading than in math, which depends more on sequential development of concepts and skills. Contrary to common opinion, which pictures gifted children as constantly bored with and antagonistic towards school, most of the gifted children like school very much and they love to learn. Many gifted children are younger than their classmates because of their superior academic performance.

Occupational Characteristics

It is not surprising that gifted students tend to enter occupations that demand greater than average intellectual ability, creativity and motivation. Most of them find their ways into the ranks of professionals and managers. A high proportion of gifted children distinguish themselves among their peers in adulthood. As educationally, they are winners occupationally also. But again, it is important to note that this description does not hold true for every gifted student.

Social and Emotional Characteristics

Gifted children tend to be happy and well-liked by their peers. Most of them are social leaders at school. They are emotionally stable and self-sufficient and are less prone to neurotic and psychotic disorders than average children. They exhibit wide and varied interests and perceive themselves in positive terms. Recent research studies have aborted the misconception that gifted persons tend to be social misfits and emotional cripples. Most societies have a great deal of trouble in dealing with extreme advance of any kind, and someone with an IQ of 180 is certainly unusual. So, it is not proper to characterise all extremely gifted people as maladjusted and eccentric.

At the same time, it is not proper to assume that gifted students are immune to social and emotional problems. They are also particularly susceptible to difficulties if they have extremely high IQ or if they are subject to social conditions, such as peer pressure towards mediocrity that mitigate against mental health. Gifted students become upset and maladjusted when they are discriminated against and prevented from realising their full potential.

Moral and Ethical Characteristics

Most studies show gifted people to be superior to average individuals in concern for moral and ethical issues and in moral behaviour. Even at earlier age, gifted children tend to be concerned with abstract concepts of good and evil, right and wrong, justice and injustice. Gifted persons tend to be particularly concerned with social problems and the ways they can be resolved. Gifted persons are the ones who have the greatest potential for helping individuals and societies resolve their moral and ethical dilemmas. It is worth noting that almost all the definitions of giftedness include people who are recognised as moral giants. However, the corruptibility of high executives in every profession in every society raises questions about the moral and ethical superiority of gifted persons. The atrocities of the Nazis in Germany, some of whom were able, creative, motivated individuals, testify to the fact that gifted and talented people can make criminal use of their potential. The moral and ethical shortcomings of these individuals are not characteristic of gifted people as group. The immoral, unethical gifted individual is an exception rather than the rule.

9.5. IDENTIFYING GIFTED CHILDREN

Parents, teachers, psychologists and social workers can help in identifying gifted children at an early stage. It is a problem that has drawn the attention of psychologists and educationists all over the world. They are

of the opinion that it is extremely difficult to assess or measure giftedness with the help of a single test or tool. Authorities in this field have proposed various procedures in which there are some overlapping to a considerable extent. Generally, intelligence tests and creative tests are administered for identifying giftedness in children. Tests of creativity involve the ability to deal with verbal and numerical symbol systems. In addition to these tests, scholastic achievement tests can also be used to assess giftedness. But the problem is that these tests are not comprehensive or valid enough to assess creativity. We shall discuss identification procedures proposed by some authorities in this field.

9.5.1. Renzulli And Delcourt's Procedure

Renzulli and Delcourt observe that four criteria are very useful to identify gifted students. The criteria are (1) test scores; (2) academic mastery in specific domains; (3) creative productivity in specific domains or inter disciplinary areas, with products being assessed by teacher judgement and student interest and willingness to pursue advanced follow up activities, and (4) long-range creative productivity the ultimate criterion, which can be used to identify gifted persons only after the fact of their performance. Test scores have been the most widely used criteria. But identification on the basis of testing alone is now widely viewed as inappropriate.

9.5.2. Getzels' Procedure

Getzels has described the following measures to assess giftedness and creativity.

(i) **Word Association Test (WAT):** The test presents words to the subjects. Each word has multiple meanings. Here the children taking the tests are required to write as many meanings as he knows for each word. Gifted children usually furnish more meanings than their age mates of average intelligence.

(ii) **Uses of Objects:** The subjects are expected to write as may different uses for each object as they possibly can. Gifted children are usually able to think of many uses of each object. From that, giftedness of children can be assessed to a considerable extent.

(iii) **Hidden Shapes:** The children are required to identify the complex figures in which the single figure appears. Gifted children are able to identify more complex figures in less time than their age mates of average intelligence.

(iv) **Fables**: Here the children are provided with the same fables whose last lines are blank. The children are required to fill in these blanks to form a suitable ending. Here, the gifted children will exhibit their originality and creativity. This will help in identifying gifted and creative children.

(v) **Make-up Problems:** Here the children are required to use the information given to them to make up as many problems as they can within a limited time span. The gifted children will be able to make up much more problems than their age mates of normal intelligence within the limited time span. Gifted children will exhibit speed and accuracy.

9.5.3. Kough and De Haon's Procedure

Kough and De Haon have developed a procedure to discover special abilities and disabilities. Their procedure is very conducive to identify gifted children. They have furnished different criteria to identify special abilities and talents among gifted children. The criteria proposed by them fall under three areas

(i) Intellectual ability
(ii) Mechanical skills
(iii) Physical skills

9.5.4. Willy's Procedure

Willy has listed out the following procedure for identifying gifted children.

- Accuracy and use of vocabulary
- Language proficiency
- Quick, keen observation and retention of information about things.
- Early interest in calendars, in telling time and in clocks.
- Quality of Concentration.
- The early development of ability to read.

This procedure largely requires keen observation on the part of the teacher and parents. Once these are observed in children, the teacher can administer intelligence test to gifted children for scientific confirmation of giftedness.

9.5.5. Simplified Procedure of Practitioners

Although the authorities in this field have proposed various procedures, the following three-step procedure is very feasible and conducive to identify gifted children. In this procedure it is the teacher who plays the prominent role. Moreover, the teacher can base his assessment on his daily observation of his students and the students' educational records. This procedure includes

(i) Observation
(ii) Educational assessment
(iii) Standardised test

Observation

This is the most convenient and practically the foremost technique to identify gifted children. Observation of the children's behaviour by the teacher as well as the experts helps in identifying gifted students. This can be done in simple as well as controllable conditions. While observing the children's behaviour a strict vigil should be kept to study their reactions to various situations. A child's behaviour can be observed not only in classroom, but also on the playground, home and in the group. Observation can be done by just scrupulously watching the child at close quarters and by moving along with the child. How the child grasps the instructional presentation and how he responds in the classroom and in the school, premise should be noted down. Observation technique is very useful for ascertaining the curricular, co-curricular, extra-curricular, and recreational interest of the children. In educational programmes such as recitation of a

memory poem or reproduction of an essay or passage of testing comprehension or a quiz programme will bring to light the giftedness or the special talent in the children. But observation technique alone will not suffice for reliable identification. So, there is a need to complement observation technique with other tests or tools.

Educational Assessment

An educational assessment provides a detailed description of the child in the school setting, giving information about:

1. The child's level of attainment in the basic subjects in terms of what he can do, what his special abilities or disabilities appear to be. Evaluation of scholastic achievement is possible through Scholastic tests. From the records maintained in the school such as mark sheets, progress cards, and cumulative records the teachers can assess giftedness or special talents of their children.
2. The child's level of language development and speech. Gifted children can be found to be far ahead of their age or classmates in this respect
3. Standards of achievement in other areas of curriculum, e.g. in art, practical subjects, physical education.
4. Emotional and social behaviour as displayed both in and out of the classroom.
5. Previous school history with particular reference to attitude towards school, their special achievement and laurels.

All the above measures can be undertaken by the teacher with the records available at his disposal. These will bring to light the giftedness or the special abilities in children. Another advantage is that all the records are available at the disposal of the teacher and no service from the experts is required to make an educational assessment of children.

Standardised test

All the gifted children are supposed to have a high IQ. Through the use of many standardised intelligence tests the intellectual level of children can be assessed. There are verbal as well as nonverbal intelligence tests, which can be used for this purpose. But the psychologists prefer individual verbal tests to group verbal tests. It is possible to get a clear picture of the mental capacities of children by administering many intelligence tests. A single test will not suffice to bring out the full picture of mental abilities of a child Psychologists usually administer more than one standardised test to make an assessment about a child Terman Merill Scale, Wechsler Intelligence Scale for Children, Revised Standard progressive matrices etc are some widely used intelligence tests. For Indian children, nonverbal tests like Raven's standard progressive matrices will be very effective. According to Terman-Merill Scale if a child is found to possess an I.Q. of 150 and above, he/she may be termed as gifted, similarly each test gives specific cut-off line or score for giftedness.

One caution must be sounded here IQ alone should not be considered a sole criterion for defining giftedness or for identifying gifted children. Standardised tests are tools of formal assessment. This formal assessment should be complemented with informal assessment measures

such as observation and educational assessment, one assessment measure without the other cannot be very effective. Hence this simplified procedure suggested by us includes three steps representing both formal and informal assessment measures.

9.5.6. Essentials of Identification

Even though there are several methods for identifying gifted children, all these methods incorporate the following salient points in their procedures.

- A teacher can perceive indications of giftedness by means of keen observation. The teacher should have adequate competency to interpret what he observes.
- Class marks and different records of student's achievement in the school may provide adequate indications.
- Individual or group intelligence tests are very conducive for identifying gifted children.

9.5.7. Limitations of Identification Technique

There are some limitations of various techniques generally used for identifying gifted children. They are as follows:

1. Intelligence tests are very expensive and time consuming.
2. Group intelligence tests are good for screening. But it is not without drawback. The major drawback is that students having motivational and emotional problems are rarely identified and so are students having reading difficulties.
3. Administration of achievement test batteries fails to identify underachieving gifted children.
4. Children having antagonistic attitude towards school are seldom identified as gifted children. This applies to students having motivational and emotional problems.
5. IQ alone cannot be considered a sole criterion for identifying gifted children. Assessment is to be based on some other aspects also, besides IQ.

9.6. EDUCATION FOR GIFTED CHILDREN

It is relatively easy to find sympathy for handicapped children, and more than a little difficult to turn that sympathy into public support for effective educational programmes. On the other hand, it is very difficult to elicit sympathy for gifted children, and next to impossible to arrange sustained public support for education that meets their-needs. Generally, gifted children face a number of problems when they attend regular classes. Usually, in the mainstream classes the educational programmes are planned and devised for children of average ability. When 'the gifted children are admitted to these classes, they are denied the opportunities they need for full development of their talents. As such, their education is restricted. The teacher also miserably fails to devise his instruction so as to accommodate individual differences. 'The worst sufferers in this respect are the gifted children.

Why special Education for Gifted Children?

The gifted children are very often allowed double promotions, which places the bright children in a senior class. It is done with an assumption that the bright child will be able to find a challenge in the work of a senior class and make use of his talents. But this is not a healthy and desirable practice. When a child is given an accelerated promotion, he is placed out of his own group with respect to physical, and emotional development. Research evidence indicates that when a child is placed with children who are higher in the developmental continuums, he usually finds himself out of step in other activities and interests. So instead of giving accelerated promotion, the gifted student can be provided with enriched programmes while he is allowed to share the experiences of children of his own level of development.

It is a common practice in school to entrust more works to gifted children. It is not a desirable practice. "It is important to note that when these students are overlooked with a mediocre type of work, it causes monotony and boredom. Giving more works is not a sign of enrichment. It is only quantitative improvement. What is needed here is qualitative improvement. The works given to these children must be challenging to them. The teacher should avoid giving them routine type of work. Gifted children want to accomplish difficult tasks, which pose challenges to them and which they can complete independently. When they investigate for themselves, it gives them a sense of satisfaction. Enrichment programme does not include repetition and drill, which are considered to be effective for backward children. But they tend to irritate the gifted students and affect their performance seriously.

When these students are not provided with enriched educational programmes, there is likelihood for them to develop bad social habits. When the task given to them is not challenging and satisfying, they tend to engage themselves in loafing and indulging in antisocial activities for excitement. When the teacher plans his work for average children, the gifted students become frustrated and they invite disciplinary problems in the classroom. When other children need one full period to complete the given assignment, gifted children will be able to accomplish it in less than half the time and they want to utilise the available extra time in an interesting way. But act of gifted children is not usually appreciated by the teachers who get distracted from their attention to majority children.

Sometimes the curriculum is planned in such a way that it would miss some of the aspects of the developments of a child. Gifted children need ample opportunities for an all-round development of their personality. Hence, enrichment of the educational programme should include development of the social, aesthetic and emotional aspects of personality in addition to academic aspects. The enriched programme must be suitable for individual needs, demands, and nature of development.

Educational Programmes of Gifted Children

An educational programme revised for the benefit of gifted students should include the following characteristics:

1) A curriculum designed to accommodate the students' advanced cognitive skills.

2) Instructional strategies consistent with the leaming styles of gifted students in the particular content areas.
3) Administrative arrangements facilitating appropriate grouping of students for instruction.

Generally, the plans can be described as providing for the following measures.

i) Enrichment.
ii) Acceleration, and
iii) Grouping in Special classes

9.6.1. Enrichment

Enrichment refers to provision of a differentiated programme of study for gifted students by the classroom teacher within the regular classroom, without assistance from an outside resource for consultant teacher. Additional experiences are provided to the gifted students without placing them in a higher grade.

Models of Enrichment

There are a few models of enrichment proposed by educators. One model of enrichment that has received widespread attention is the "Revolving Door Model". This model is based on the notion that children manifest gifted behaviour in relation to particular projects or activities on which they bring to bear their above average ability, creativity, and task commitment. Students are selected to constitute a talent pool through case study identification methods. These students are engaged in enrichment activities that involve individual to small group investigation of real-life problems. They become participating pollsters, politicians, geologists, editors, and so on. The teacher should help students translate and focus a general concern into a solvable problem and provide the students with required tools and methods to solve the problem. Further, he should assist the students in communicating their findings to authentic audiences. Students can stay in the enrichment programme as long as they have the ability, creativity, and motivation to pursue productive activities that go beyond the usual curriculum for students of their age.

Major Components of The Schoolwide Enrichment Model

Curriculum Compacting. 'Modifying' or 'streamlining' the regular curriculum in order to eliminate repetition of previously mastered material, upgrade the challenge level of the regular curriculum, and provide time for appropriate enrichment and/or acceleration activities while ensuring mastery of basic skills.

Assessment of Student Strengths. A systematic procedure for gathering and recording information about students' abilities, interests, and learning styles.

Type I Enrichment: General Exploratory Experiences. Experiences and activities that are designed to expose students to a wide variety of disciplines (fields of study), visual and performing arts, topics, issues, occupations, hobbies, persons, places, and events that are not ordinarily covered in the regular curriculum.

Type II Enrichment: Group Training Activities. Instructional methods and materials that are purposefully designed to promote the development of thinking and feeling processes.

Type III Enrichment: Individual and Small Group Investigations of Real Problems. Investigative activities and artistic productions in which the learner assumes the role of a first-hand inquirer, the student thinking, feeling, and acting like a practicing professional.

A school wide enrichment model has been developed more recently the school wide model was designed to reduce the "separateness" of special and regular programmes and to make certain that all students who can profit from enrichment activities are given opportunities to engage in more challenging activities. The objectives of "curriculum compacting" are to create a challenging learning environment, guarantee proficiency in basic curriculum and make time for enrichment and acceleration. All the student's strengths are assessed. Type I enrichment provides general exploratory experiences. Type II Enrichment comprises group training activities, and Type III Enrichment incorporates individual and small-group investigations of real problems.

Research evidence suggests that this school-wide enrichment model can improve the learning environment for all the students. Also, it improves the attitude of the students and teachers towards education of the gifted and makes special programming for gifted students a more integral part of general education. These outcomes disclose the effectiveness of special programmes for the gifted students. The gains that the gifted education has made in instructional technology and the commitment that this field has made to serving out most potentially able youth well will only have long-term endurance when they are woven into the fabric of general education.

9.6.2. Acceleration

Acceleration contributes to academic achievement. No negative effects on social or emotional development have been established. If at all any adjustment problems occur, they tend to be minor and temporary in nature. On the other hand, failure to advance a precocious child may result in poor study habits, apathy, lack of motivation, and maladjustment. Those who argue against acceleration are of the firm opinion that the children who are grouped with older students will suffer negative social and emotional consequences or that they will become contemptuous of their age-peers. While the opponents of acceleration argue like this, the proponents argue that by being grouped with older students who are their intellectual peers in classes in which they are not always first or correct, the gifted students acquire a more realistic self-concept and learn tolerance for others of inferior abilities. So far, the research evidence seems clearly to support acceleration, especially in the case of the most gifted students.

9.6.3. Grouping in Special Classes

Psychologists and educationists recognise the need for special classes and school for the education of gifted children. These classes are called elite classes. Researchers have established the efficacy of special classes. Still the situation is not so simple as it is tough to be.

The debate on desirability of special education for the gifted is still going on. There are strong arguments for and against special classes and

schools. Some of the points advanced by the proponents of special classes are as follows:

1. The task assigned to average children in regular classes is not adequate for the gifted children. They are restrained to a great extent. On the other hand, in a special class they are provided with enriched activities to work according to their superior ability. Another pertinent fact is that special class provides for mutual stimulation, which induces the gifted children to progress and develop more rapidly.

2. Placing gifted children in regular classrooms tends to develop some careless habits in them. The gifted children find the task given to them very easy and sometimes they don't feel like working them out. This may lead to indiscipline and maladjustment. On the other hand, the special classes offer challenging tasks to gifted children and enable the children to develop their potentialities to the maximum.

3. Where there is no provision for special classes the gifted children are given accelerated promotion. This method forces the gifted children to learn with more mature and older children. A point to be noted in accelerated promotion is that a superior child may not necessarily be superior in sociality and other aspects of development. As a result, he may face some problems of social adjustment. There is no such problem in special classes where they have the scope for passing grades at normal rate and opportunity to move with his own ability group.

4. In the regular classroom the tasks assigned to the entire class are much simple for gifted students who finish much quicker than the anticipated time span. This leave them with time to spare till the average children complete the tasks. In the meantime, the alert mind of gifted children is diverted to seek some other outlet. This warrants special classes for gifted children where they can be provided with enriched activities to keep them at desk and on the job during the entire time span.

5. The empirical works in this area indicates that special classes also provide ample opportunities to develop leadership qualities in various arenas. There may be some children specially gifted in painting, poetry, mathematics, literature and other branches of knowledge. More developed and well-planned programmes can facilitate manifestation of their special talent and their emergence as prominent ones in these particular fields.

6. It is rightly pointed out that gifted children are made of finer stuff than the majority of children. These children are more sensitive, alert, and quick in their thinking. lf proper stimulation is not provided to these children, they tend to create problems in the class. When these children are put together with the average group, an inferior ability group, the teacher finds it very difficult to devise his instruction so as to accommodate both the groups. Treatment and handling of these two types of groups become very difficult for teacher. If the either group is given importance, the other is neglected.

Although the above arguments have been advanced by the proponents of special classes, the opponents of special classes also advance some points against the special classes. Those psychologists and educationists, who oppose special classes, strongly refute the isolation or segregation of gifted children from regular schools. They have their own reasons. These reasons should be taken as constructive criticisms of the

move. The counter arguments advanced by the opponents of special classes for gifted children are as follows:

- The potent criticism against special class for gifted children is that it is highly undemocratic. Equal opportunity of education should be provided to one and all.
- There is a striking possibility for gifted children to develop conceit, if they are taken away from regular classes. They become more aware of their superior ability and fail to develop modesty as personality trait.
- Special classes give rise to a kind of intellectual aristocracy. The segregation of gifted children and formation of special ability groups give rise to ideas of superiority.
- Isolation of gifted children from regular class affects the average children very much. While learning with gifted children, average children get ample opportunities to learn many things. Withdrawal of gifted children from regular class deprives the average children of rich stimulation.
- Special class programme deprives the society of superior leadership. While working with average children, the gifted children get chances to act as leaders and get training in leadership. This in the long run, provides the society with good leaders.
- The most important criticism levelled against special education is the high cost of such programmes. When there is not enough money, especially in a developing country like India, for the education of majority average children such expensive programme for the gifted children is least desirable.

9.6.4. Teaching Gifted Students in General Education Classroom

Gifted students who demonstrate gifted behaviour are superior in some way and exhibit abilities and sensitivities that makeup them express themselves in special ways learn quickly, be self-sufficient; or understand their own and others' feelings, motivations, and strengths and weaknesses. So, the classroom teachers should assume the responsibility during most of the school day for providing the educational experiences for gifted and talented students. There are certain techniques that have been verified to be effective tin teaching gifted and talented students in general education classrooms. Some of the techniques that teachers can try for teaching gifted and talented students are discussed below.

Self-Directed Learning

One type of experience that benefits the academically gifted students is self-directed learning, which helps students move systematically from teacher determined and directed instruction towards independent learning.

The main goals of self-directed learning are as follows.

- Learning to function effectively in one's total environment.
- Learning to make choice and decisions based on self-knowledge of needs and interests.

- Learning to assume responsibility for choices and decisions by completing all activities at a satisfactory level of achievement and in an acceptable time frame.
- Learning to define problems and to determine a course of action for their solution; and
- Learning to evaluate one's own work.

The proponents of self-directed learning programme believe that the process of self-directed learning culminates in students being able to initiate plans for their own learning, identify resources, gather data and develop and evaluate their own products and projects. There are a variety of techniques such as curriculum compacting, learning centres, independent study, and contracting to promote self-directed learning in the general education classes at all grade level. A brief discussion of each of these techniques is presented here.

Curriculum Compacting

Curriculum compacting is a procedure in which the teacher modifies the regular curriculum to provide additional time for gifted students to pursue alternative learning activities. These modifications must be made based on the strengths of the gifted students, using a variety of information sources such as school records, previous teacher recommendations, standardised and informal tests results, and observation. After deciding what curricular areas are most appropriate for compacting, the following questions should be considered

1. What does the student already know?
2 What does the student need to learn?
3. What activities will meet the students learning needs?

Having made these assessments and instructional decisions, the teacher must decide how to provide appropriate alternative educational activities.

Learning Centres

Teachers can make use of learning centres to provide the gifted students with enrichment activities. These centres must offer instructional opportunities in areas that are specifically designed and sequenced to encourage student independence.

This will promote self-directed learning. Interest development centres also can be designed by teachers to offer activities that develop productivity and creativity of their gifted students. While the traditional learning centres help students master basic curriculum skills, interest development centres (IDCs) facilitate students' exploration of a wide range of topics not included in the regular curriculum. The centres must have adequate manipulative, media and print materials along with several suggestions for examining and experimenting in special interest areas.

Independent Study

Sometimes students will develop great interest in a topic they have explored. When the gifted students develop such interest, the teacher should encourage them to, conduct an independent study on their topics of interest. Independent study involves not only the exploration of a topic in depth but also the production of an original report that is disseminated to an

appropriate audience. Directing independent study is time consuming and it requires an understanding of the topic. So the teachers often seek the help of a resource teacher and another person who is knowledgeable about the subject and willing to participate in the project. The role of the teacher and resource person(s) is/are not to be director of the study; rather, they serve as assistants who help the students. They should offer specific helps to students to

1. Define and frame the problem.
2. Establish realistic goals and time lines
3. Become aware of a variety of usable resources.
4. Identify both a product that the study will produce and an audience for the product.
5. Make a self-evaluation of their study.

In addition, the adults involved in the project must reinforce the students' work throughout the study and provide methodological help when necessary.

Contracts

Teachers can facilitate self-directed learning by providing individualised exploration and instruction in the form of student contracts. Like business contracts, these documents are negotiated with the students and describe the area each student will study and procedures and resources he or she will use in the investigation. Contracts are used to guide independent study. Also, the contracts can, specify the intended audience, the means of dissemination, deadlines for stages or steps in the study, and dates and purposes of periodic meetings with the teacher.

Thus, the teachers can teach gifted and creative students in general education classroom. The teacher must be a source of inspiration and encouragement. He must provide opportunities as discussed above, to gifted children to test their potentialities and to explore more avenues.

When the teacher provides for self-directed learning, it benefits both the gifted and the average children. It benefits the gifted children in the sense that it enables them to work to their potentials, and it benefits the average children in that the interactions of gifted students provide adequate stimulation and motivation to average students for better acquisition of knowledge and realisation of educational objectives.

Check your Progress - 1

Note a. Write your answer in the space given below.

b. Compare your answer with those given at the end of the unit.

1. Define Gifted Children.

……

2. What salient points would you keep in mind while using the methods to identify giftedness?

……,.

9.7. CREATIVITY

9.7.1. Meaning and Definitions of Creativity

Creativity in its simple literal meaning stands for the ability or capacity of a child to create or produce something. In such a sense, every one of us may be said to be a creator in one or the other aspects as we remain engaged in creating or producing some or the other things in our life. To say that such creation or production on one's part should appear somewhat different. But this is also a quite relative thing based on one's perception. To many parents, there may seem so much creativity in their children's otherwise normal or bizarre acts. For many, it has become an act of fashion to talk about the creative sparks of their children. There exist a sort of chaos and confusion in dealing with the creativity of our youngsters. It needs immediate attention.

Wilson, Guilford and Christensen: "The creative process is any process by which something new is produced—an idea or an object including a new form or arrangement of old elements. The new creation must contribute to the solution of some problems." (Dutt, 1974, p. 208)

Skinner (1968): "Creative thinking means that the predictions and/or inferences for the individual are new, original, ingenious and unusual. The creative thinker is one who explores new areas and makes new observation, new predictions and new inferences."

Papalia and Olds (1993): Creativity is the ability to see things in a new way, to see problems that no one else may even realize exist, and then come up with new, unique, and effective solution to these problems. Standard intelligence tests measure. Convergent thinking- the ability to come up with a single correct answer, but creativity involves divergent thinking – the ability to come up with new and unusual answer.

9.8. IDENTIFICATION OF CREATIVE CHILDREN

Although every one of us is endowed with some aspects of creativity, its distribution is neither equal nor universal and some individuals have greater creative potential than others. Researches in this regard have established that creativity is not necessarily accompanied by a high level of intelligence. Guilford (1959) has clearly made the distinction by proposing the concept of convergent and divergent thinking, the latter being closely associated with creative thinking. Similarly, Getzels and Jackson (1962) have successfully argued that creativity was far more independent of IQ, especially at the upper levels. Therefore, a genius or a gifted person may not have a very high IQ as creativity in its many shapes and forms is an expression of giftedness, and not of a high degree of intelligence. How then, can the creative children be identified.

Behaviour as we know is expressed through its cognitive, conative and effective components and creative behaviour is no exception. Consequently, a child is creative to the extent to which he can demonstrate creative potential in his thinking, actions and feelings. For a total assessment of his creative behaviour, we have to apply a multi-dimensional approach involving the use of the available creative tests and the multiple non-testing devices like observation, interview, rating scale, personality, inventory,

situational tests, interest inventories, attitude scales, aptitude tests, value schedules and projective techniques, etc. The characteristics and personality traits of the creative mentioned earlier may also serve the purpose by providing reliable indications for the identification of creative potential which may be further verified by comparing the performance with standardized creativity tests.

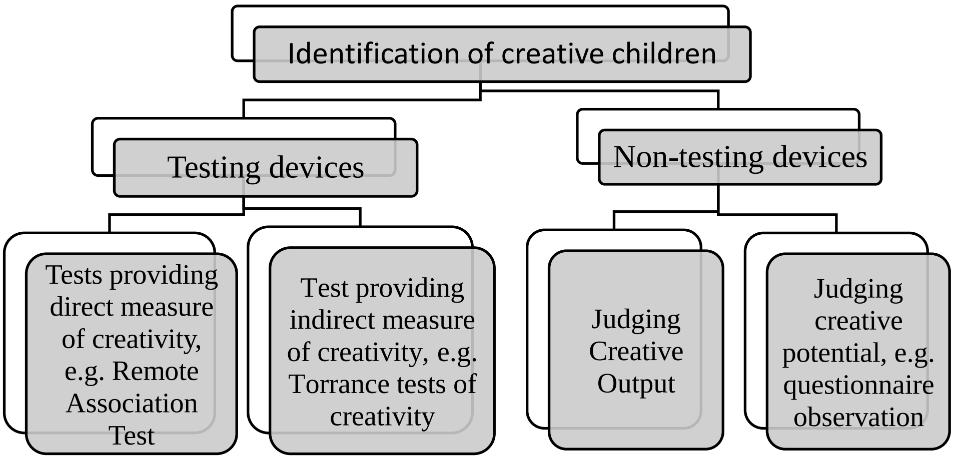
All these measures involved in a comprehensive evaluation of one's creative potential may be broadly categorized as testing and non-testing devices. In the testing device category, we may include two types of standardized tests:

- Tests that provide a direct measure of one's creativity, i.e. The Remote Association Test.
- Test that provide an indirect measure of one's creativity by evaluating elements comprising, creativity, e.g. Torrance Tests of creative thinking and Baqur Mehdi's tests of creative thinking.

In the non-testing device category, we may include the following types of measures:

- Non-testing measures for judging creative potential
- Non- testing measure for judging creative output.

We can represent the totality of these measures of creativity through a diagram like the following:



Classification of Creativity Measures.

Let us now have a brief idea about all such measures of creativity among the children.

9.8.1. Testing Devices Providing Direct Measure of Creativity

As a direct measure for the assessment of one's creativity we can utilize the devices like Remote association test, Word Association Test, story writing or other useful projection techniques, like Children Apperception Test (CAT), Thematic Apperception Test (TAT) and Rorschach Ink Blot Test, etc. Let us illustrate the use of a few of them.

The Remote Association Test (RAT)

As a basic test of creativity, this test has been designed by Sarnoff Mednick (1962). It consists of 30 sets of three words that are known to have weak (remote) ties with each other, i.e. related with each other in one or the other way. The child appearing for this test, is now asked to find a fourth word that seems to be related to the other three (given in a particular set).

In this way attempts are made to test one's ability to establish remote relations, an ability directly associated with creativity which helps one to make use of his unconscious wisely for providing creative ideas. A sample of this test is reproduced here for illustration.

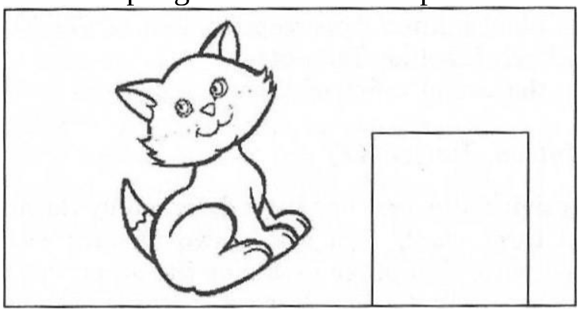
Instructions. In this test, you are presented with three words and asked to find a fourth word that is related to the other three. Write the word in the space to the right. Read first the example to help you in your task. *Example:* What word do you think is related to these three?

Cookies, Sixteen, Heart_________ ( )

The answer in this case is sweet. Cookies are sweet. Sweet is part of the phrase sweet sixteen and part of the word sweet heart.

Story Writing Test: This test has been developed by Torrance and others (1963) for providing assessment of one's creative writing ability. Let us illustrate it by providing a specimen.

Make up a story about the picture shown in Figure below as descriptive and imaginative as you can. Think of a story that no one else would and take up eight minutes to complete it.



Story Writing Test

Scoring. Is done based on the following factors.

1. Picturesque wording (If it is strikingly graphic, colourful and descriptively objective)
2. Vividness (penetrating strength and force)
3. Original setting
4. Individuality of style
5. Becomingness (identification of the characters of the story)
6. Perceptual sensitivity (insight and empathy for the feelings and dilemmas of the characters)
7. Imagination
8. Finding the essence (all the words and phrases seems appropriate and essential to the plot of the story)
9. Flexibility (the style is fresh and vigorous even excitingly different)
10. Communication of emotion (Establishment of a distinct mood or feeling, cheerfulness, gloominess, suspense, surprise, etc.

Testing Devices Providing Indirect Measure of Creativity

A number of creative tests (Standardized in India and abroad) like Torrance tests of creative thinking, Wallach and Kogan creativity instruments, Baqer Mehdi's tests of creative thinking, Passi's tests of

creativity, etc. Attempt to measure several known dimensions of one's creative behaviour through their test items—verbal and non-verbal. These can be used to identify the creative potential of the children in the same way as we make use of intelligence tests for the assessment of their intelligence.

Torrance Tests of Creative Thinking

Creativity tests developed by E. Paul Torrance, the eminent American psychologist, cover both verbal and non-verbal activities performed by the subjects and are claimed to be successfully used from kindergarten to graduate school. For testing the nonverbal performance, Torrance has developed Torrance test of creative thinking (figural forms A and B) and for the verbal performance, the Torrance test of creative thinking (verbal forms A and B). Forms B are the equivalent alternatives of the forms A of these tests.

The figural forms (employed as a non-verbal testing device). This make use of tasks that require drawing and picturization. The activities required in the nonverbal sub-tests are of the following nature:

1. **Figure or picture completion test**. In this subtest, there are some incomplete figures. The subject is asked to complete these figures by adding new dimensions or lines for providing new ideas. He is also asked to give suitable titles for the completed figures or pictures.

Sample items from the Torrance tests of creative thinking (Figural form)	

Creativity Figure or Picture Completion Test.

2. The verbal forms*:* The verbal forms (employed as a verbal testing device) incorporate tasks which require the use of language. The subject is required to provide written responses to the questions put to him. The verbal activities asked to be performed are of the following nature:

- ***Asking type.*** In asking type of activities, the subject is encouraged to reveal his ability to perceive all things which are not normally perceived by others. The help of some pictures may be taken for this purpose. In these activities the subject may also be asked questions that would enable him to fill in the gaps in his knowledge.
- ***Guess causes and guess consequences type.*** Both these guessing type activities are aimed at revealing the subject's ability to formulate hypotheses concerning cause and effect while being presented with a picture, the subject may be asked to guess what lies behind the situation.
- ***Product improvement type.*** In these activities, the subject is asked to suggest ways and means of improving a toy, a machine or some other such product to make it as interesting and useful as possible.

- ***Unusual uses type.*** These devices are meant to test the subject's divergent thinking about the number of ways in which a product may be used. Here the subject has to enumerate as many unusual uses as he can think of, for instance, in how many unusual ways can a knife or brick be used?

All the activities mentioned above, both on figural and verbal forms, are evaluated in terms of the creative abilities such as originality, fluency, flexibility and elaboration, etc. An overall high score on the various subtests of the Torrance creative test gives the tester an idea of the overall creative potential of his subject. However, for a more reliable and valid appraisal of creative potential, one has to take recourse to other non-testing devices and personality assessment measures.

9.8.2. Non-Testing Devices for The Measurement of Creativity

We may make use of these devices for the judgment of one's creative potentials as well as for his creative output. Let us discuss both types of these measures one by one.

Making Use of Non-Testing Devices for Judging Creative Potential

A number of measures like questionnaires, rating scales, check lists, situational tests/ observation, interview, inventories, etc. may be utilized for the assessment of one's creative potential. However, for illustration of the nature of the items utilized in such measuring instruments, we are hereby presenting a few.

EXAMPLE 1 Rating scale / self-reporting measure:

Please report to the following questions about yourself/child (use the given five points scale).

Sample item. My child has a vivid imagination.
Strongly disagree, Disagree, Neutral, Agree, Strongly agree

EXAMPLE 2 Questionnaire:

It may consist of several statements. Some of them may be true characteristics of the creative behaviour and others not. The respondent has to mark his responses by saying yes or no.

Sample items.

1. I like things in my life to remain stable.
2. I like to depend only on myself when deciding what to do.
3. I usually say what I think about things.
4. I like to come and go whenever I please.
5. In my day dreams, I am likely to imagine being saved from great danger by someone I admire.

(The serial No. of sample items indicative of creative behaviour are 2, 3 and 4)

Observation and interview techniques may also be utilized for the assessment of children's creative potential. In adopting observation as a technique either one has to observe one's behaviour in naturalistic condition or in the controlled conditions where a problematic situation gets created for studying the responses of the individual

In interview, face to face interaction, between the respondent child and interviewer, the child may be asked to respond a number of well thought questions quite indicative of the presence or absence of the child's creative

NOTES

potential or may be asked to attempt the situation of a problem of which he or she has no special knowledge.

Making Use of Non-Testing Devices for Judging Creative Output

Here attempts are made to have an assessment of one's creativity on the basis of the worth of one's creative output. The usual process consists of appointing a panel of judges, experts in the field of creative production or specially trained personnel capable of carrying out objective assessment of the creative output. For a guiding example, we may quote a widely accepted measuring device named as Creative Product Analysis Matrix (CPAM) designed by Basemer and Treffinger (1981). We have already given its reference while discussing investigation of creativity under the title creativity as a product.

As mentioned, we make use of their three general categories—novelty, resolution, and elaboration and synthesis (words and phrases used to describe creative potential), along with their respective attributes as criteria of assessing one's creative output. Accordingly:

- *Novelty* is to be assessed in terms of the original, surprising and germinal attributes
- *Resolution* is to be assessed in terms of the valuable, logical and useful attributes.
- *Elaboration and synthesis* are to be assessed in terms of the organic, elegant, complex, understandable and well-crafted attributes.

The panel of judges may make use of the above categories and attributes for assessing the worth of one's creative output.

9.9. NURTURING AND STIMULATION OF CREATIVITY AMONG CHILDREN

Creativity as a spark of creating something is present in all the human beings to a lesser or greater degree since their very birth. It is reflected easily through a child's ceaseless inquiry about himself and the things around us and his eagerness in doing one or the other type of experiments as an attempt of exploring his environment. His ideas are quite new and novel as he happens to be a clean slate and likes to travel to his own chosen path free from the rigidity and functional fixity of the past. It is such creative state that has been a subject of admiration as Jean Piaget, the famous authority on child psychology and activity states "If you want to be creative, stay in part a child, with the creativity and invention that characterizes children before they are deformed by adult society."

It becomes essential, therefore, for teachers as well as parents to realize the need of creating an environment conducive to full growth and development of the creative abilities of children.

Proper stimulation and nurturing of the traits which help to develop creativity, namely, originality, flexibility, divergent thinking, self-confidence, persistence, sensitiveness, ability to see relationship and make associations, etc. are essential for this and may be achieved through the following practices.

1. *Freedom to respond.* We should allow adequate freedom to our children in responding to a situation. They should be encouraged to think out as many ideas as they can for the solution of a problem.
2. *Opportunity for ego involvement.* Actually a child can be expected to put in determined efforts into creative activities only when his ego is involved, i.e. when he feels that a particular creative work is the outcome of his efforts. We should, therefore, provide opportunities to children to derive satisfaction from identifying themselves as the cause of a product.
3. *Removal of hesitation and fear.* The teachers and parents should encourage and persuade the hesitant children to express themselves by saying or writing something, anything, no matter how crude it may be.
4. *Developing healthy habits among children*. Industriousness, persistence, self-reliance and self-confidence are some of the qualities that are helpful in creative output. Children should, therefore, be helped to imbibe these qualities.
5. *Teaching self-responsibility*. For being creative, the children should be made to learn to take responsibility for both success and failure, cause and consequences of their actions. They must learn to get their creative ideas converted into action and use instead of waiting for other to get them into use or publicize.
6. *Teaching children to face and learn from their mistakes*. Creative behaviour is fearless in facing one's mistake. In creative functioning, a mistake is an experiment to learn from valuable information about what to try next. The saying of the famous scientist Albert Einstein, "The people who never made a mistake never tried anything new" should therefore be always kept in mind by the parents and teachers while guiding their children to their learning path.
7. *Making judicious use of blame and praise.* We often make use of the techniques of blame and praising for cultivating desirable behaviour among our children. Creativity cannot develop under constant criticism but on the other hand, a wrong kind of praise can be just as damaging. When, under ignorance, the elders try to appreciate any act of a child by saying 'good' or 'wonderful', its wonderful effect in term of reinforcing the behaviour gets diminished. Moreover, in other situations they may lose interest in doing these work (mostly of creative nature) which are not liked by teachers and parents and bring no or less appreciation and rewards.
8. *Providing appropriate opportunities and atmosphere for creative expression.* A healthy atmosphere, favourable for creative thinking and expression is essential for the stimulation and nourishment of creativity among children. Co-curricular activities in school can be used for providing opportunities for creative expression. Religious festivals, and social get-together, exhibitions, etc., can also provide the opportunity for creative expression.
9. *Avoidance of blocks to creative thinking*. Factors like conservation, faculty methods of teaching, unsympathetic treatment, fixed and rigid habits of work, anxiety and frustration, excessively high standards of achievement for low levels of work, overemphasis on school marks,

authoritarian attitude of teachers and parents, etc., are known to be detrimental to the growth of creativity among children.

10. *Proper organization of the curriculum.* Learning experiences in the form of curricula should be so designed as to foster creativity among children. It should also cater to the individual needs of each student rather than to the generalized needs of all students. It should be quite flexible and make provision for studying and working without the threat of evaluation. The curriculum should reflect what is expected from the creative children in terms of fluency, flexibility, originality, divergent thinking, inventiveness and elaboration, etc.
11. *Reform in the evaluation system.* Our education system is totally examination oriented and appropriate reform must, therefore, be made in our evaluation system, if creativity is to be nurtured. The emphasis on memorization by rote, fixed and rigid single responses, and convergent thinking, etc. which kills creativity of the children should be abandoned and a proper evaluation system adopted for encouraging complete and balanced experiences in developing their creative behaviour.
12. *Providing stimulation and encouragement to child's originality and flexibility.* The essence of one's creativity lies much in one's originality or novelty as well as flexibility demonstrated by him in his thinking, feeling and doing functions. Therefore, attempts should be made to provide due stimulation and encouragement for the cultivation of these two essential characteristics in the child's behaviour.
13. *Making use of the creative resources of the community*. Children should be made to visit the centres of art, scientific, and industrial creative works. This may stimulate and inspire them for creative work. Creative artists, scientists and creative persons from different fields may also be occasionally invited to the school to interact with the children in an effort to enhance the scope of knowledge of our children and kindle the spark of creativity in them.
14. *Encouraging children to sensible risks*. Most creative work goes at least slightly against the established ways of doing things and the results are not always positive. One has to take a reasonable calculated risk for achieving something extra than the others. It is a golden rule of the success in life.
15. *Teaching them delaying gratification*. It is a certified fact that those who are willing to endure the stress of prolonged efforts can reap higher pleasure of their creative functioning. The children who are in the habit of doing work for the gratification of their immediate needs, praise or reward, cannot walk on the tedious path of creativity. Students, therefore, should be made to learn that rewards are not always immediate and that there are benefits of delaying gratification. The greater rewards are often those that are delayed.
16. *Allowing time for creative thinking and creative output*. A readymade answer or the traditional method employed for solving some problems may be easily and promptly reproduced by most of the children. But a novel and original response or adoption of new path full of diversification may need reasonable time on the part of a creative thinker. It is also possible that a creative mind may respond in a

particular situation by providing a striking creative response or solution.

17. *Use of special technique for fostering creativity.* Researchers in the field of creativity have suggested some special techniques and methods for fostering creativity among children. A few of these are mentioned:
   a) *Brain storming.* It is said to be a brain child of the Alex Osborn, an executive of a major New York advertising firm. In its functioning, it represents a strategy or technique for allowing a group to explore ideas without judgment or censure. In actual practice, the children may be asked to sit in a group for solving a problem and attacking it without any inhibition from so many angles, in fact literally storming it by a number of possible ideas and solutions. To start with, the students may be provided with a focus, i.e. a particular problem like 'Student unrest, 'growing unemployment in India', 'how to check truancy in our school', 'what to do for improving school library services', etc. The students are then asked to suggest ideas as rapidly as possible by observing the following norms:
      - All ideas to be encouraged and appreciated, therefore, no criticism be allowed during the brain storming session.
      - Students are encouraged to make their ideas as unusual as possible and suggest as many ideas as they can.
      - They are encouraged not only to put altogether separate ideas but to suggest ideas that may be built on ideas already given by the fellow students.
      - No evaluation or comment of any sort should be made until the session is over. After the expiry of the session, all the ideas received (preferably written on the blackboard) should be discussed in a very free, frank and desirable environment and the most meaningful ideas should be accepted for the solution of the problem in hand.
   b) *Use of gaming technique.* Gaming technique is a playful spirit to help the children in the development of creative traits. These techniques provide valuable learning experiences in a relaxed, spontaneous and evaluative situation. Both verbal and non-verbal stimulus material is used in such techniques. Children may be asked to name all the round things they can think of, tell all the different ways a knife may be used, or all the ways in which a cat and a dog are alike. In non-verbal transactions the children may be asked to build a cube, construct or complete a picture, draw and build patterns, interpret the patterns of drawings and sketches, and build or construct something or anything out of the raw material given to them.
18. *Helping children in overcoming obstacles.* The creative path is full of resistance and struggle. The children may find themselves locked somewhere while engaged in their creative activities. At such juncture, parents and teacher must provide them moral, psychological and technical support for bailing them out from the surmounting obstacles.
19. *Using examples and profiles of creative people*. Nothing can prove more stimulating, inspiring and torch bearing to the children than the

life sketches and events of the great creative people. It can make them realize the secrets of the art of creative functioning and the ways of struggling of the creative thinkers. How did Archimedes get a sense of EUREKA feelings during his discovery of laws of floating bodies may teach valuable lesson to the children for the promotion of their creativity?

In this way, the task of stimulating and nurturing of the creativity among our children needs a multi-dimensional and multi-handed efforts on the part of the teachers, parents and other social institutions of the society. No society and nation can afford to ignore the talents and creativity of their younger generation not only for the sake of their welfare but also for the sake of its own existence and survival in this fast running world.

Check your Progress - 2

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

3. Define Creativity.

....

4. How will you foster creativity among children?

....

9.10. LET US SUM UP

In this unit, you have learnt about the meaning, definition and characteristics of gifted children, identification of gifted children, education for gifted children, meaning and definitions of creativity, identification of creative children, nurturing and stimulation of creativity among children. This knowledge of gifted and creative children would help the teachers particularly, in identifying the gifted and creative children and also to offer various educational programmes to promote giftedness and they would come to know about how to foster creativity among children.

9.11. UNIT END EXERCISES

1. State the characteristics of gifted children.
2. Discuss the identification procedures you would adopt to identify gifted children.
3. State the limitations of giftedness identification techniques.
4. How will you teach gifted students in the regular classroom?
5. Explain the need for special education programmes to the gifted.
6. What special education programmes would you adopt for the education of gifted?
7. How will you identify creative children?

8. What special education programmes would you adopt for developing creativity among children?

9.12. ANSWERS TO CHECK YOUR PROGRESS

1. Gifted children can be defined for purposes of education as those children who demonstrate or manifest potential for high ability including high intelligence, high creativity and high task commitment.
2. The teacher should keep in mind the following points while using the methods to identify giftedness.
   - A teacher can perceive indications of giftedness by means of keen observation. The teacher should have adequate competency to interpret what he observes.
   - Class marks and different records of student's achievement in the school may provide adequate indications.
   - Individual or group intelligence tests are very conducive for identifying gifted children.
3. Creativity is the ability to see things in a new way, to see problems that no one else may even realize exist, and then come up with new, unique, and effective solution to these problems - Papalia and Olds (1993)

4. Creativity can be fostered among children through following practices

- Freedom to respond
- Opportunity for ego involvement.
- Removal of hesitation and fear.
- Developing healthy habits among children
- Teaching self – responsibility
- Teaching children to face and learn from their mistakes.
- Making judicious use of blame and praise.
- Providing appropriate opportunities and atmosphere for creative expression.
- Avoidance of blocks to creative thinking.
- Proper organization of the curriculum.
- Reform in the evaluation system.
- Providing stimulation and encouragement to child's originality and flexibility.
- Making use of the creative resources of the community.
- Encouraging children to sensible risks.
- Use of special techniques such as brain storming, idea starter, gaming technique etc.

9.13. SUGGESTED READINGS

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UNIT X: SENSITIZATION AND MOBILIZATION TOWARDS COMMUNITY ORGANIZATION

STRUCTURE

10.1. INTRODUCTION

A “community” can be described as people living together in some form of social organization and cohesion. However, generally communities are not homogeneous, and their members often have different political, economic, social and cultural characteristics, interests and aspirations. For example, in a “traditional” rural community, members may belong to different ethnic groups, speak different languages, have different religious beliefs and engage in different cultural practices.

Community development issues that relate to health, education, water and sanitation, housing, transportation and the environment, all have an impact on the incidence and prevalence of disability. So, disability is an important issue within communities, yet it is most often ignored.

In many communities there are barriers which impact on the quality of life of people with disabilities and their family members. These include physical/environmental, attitudinal, cultural, and services, system and policy barriers. More detailed accounts of the different types of barriers that people

with disabilities and their family members may encounter are given in the different components of these guidelines. It is important that CBR programmes are able to identify and understand the barriers in each community which impact most on people with disabilities and their families.

10.2. OBJECTIVES

After reading this unit, the readers shall be able to

- Understand the significance of sensitizing the community on disability.
- Comprehend the concept of community mobilization.
- Acquire knowledge about various awareness programmes for disability.
- Organize and conduct disability awareness programme.
- Utilize appropriate mass media for creating awareness for disability.

10.3. SENSITIZATION AND MOBILIZATION TOWARDS COMMUNITY ORGANIZATION

The key to improve the lives of persons with disability (PWDs) is through educating the public on what disability is and what rights PWDs are entitled to. Through education, the stigma and myths surrounding disability can be broken. The sensitization towards disability aims to break the stigma through education, working to foster greater inclusiveness for PWDs in society and to promote disability rights. This sensitization could be achieved through various awareness programmes. To reach the general public we present films, conduct presentations and talks about disability on the radio and in communities and schools. Every member of society is able to contribute to society and PWDs have the same potential and ability to achieve great things as everyone else. Stigmatization, however, acts as a barrier to this potential, leading to discrimination and low self-esteem and confidence for PWDs.

10.3.1. Community Mobilization

Community mobilization is the process of bringing together as many stakeholders as possible to raise people's awareness of and demand for a particular programme, to assist in the delivery of resources and services, and to strengthen community participation for sustainability and self-reliance. A lot can be achieved when people from different parts of the community share a common goal and actively participate in both identifying needs and being part of the solution. Community mobilization helps to empower communities and enable them to initiate and control their own development.

Little progress will be made towards mainstreaming disability until community support is built up and the different sectors of society become actively involved in the process of change. Community Based Rehabilitation (CBR) programmes can use community mobilization to bring together stakeholders in the community, e.g. people with disabilities, family

members, self-help groups, disabled people's organizations, community members, local authorities, local leaders, decision- and policy-makers, to address barriers within the community and ensure the successful inclusion of people with disabilities in their communities with equal rights and opportunities. This element focuses on how CBR programmes can bring people together to act and bring about change in the communities in which they operate.

10.4. NEED AND IMPORTANCE

Local communities should be empowered to remove barriers for people with disabilities and their families, and play an active role in facilitating the inclusion of people with disabilities and their families in community activities. It is essential to mobilize the community to ensure that negative attitudes and behaviours towards people with disabilities and their families' change that the community is supportive of CBR programmes, and that disability is mainstreamed across all development sectors.

- Communities are aware about the needs, and motivated to improve the quality of life, of people with disabilities and their family members.
- Barriers in the community are reduced or removed for people with disabilities and their family members.
- Communities are knowledgeable about CBR and how community resources can be used to develop and sustain CBR programmes.
- Communities participate in planning, implementing and managing CBR programmes.

10.5. AWARENESS PROGRAMS FOR DISABILITY

Students should be aware of the programs to be conducted at the community level with regard to disability management. The people should accept the disabled persons in the community by giving equal rights. Disabled people are no way inferior to anyone in the community. They need opportunities rather than sympathy in order to expose their talents. There are lot of policies, legislations and programs for all persons with disabilities which are to be implemented properly for their welfare. Disability management starts with the acceptance of the disabled persons in the family and community. Early identification, referral, early intervention programs, education, rehabilitation and follow-up services are the essential aspects of disability management. Some of the communities do not know the abilities of the disabled persons. They see their disability only. In such communities, the awareness programs on disability should be conducted to make the people understand the disabled people who can also contribute to the development of the society. For conducting such disability awareness programs, proper planning, organization and media selection are essential

10.6. Planning Disability Awareness Program

Disability awareness means educating people regarding disabilities as the biggest barriers people with disabilities encounter are other people. There is a need to focus on successful role models of disabled persons for bringing the positive attitude of the community towards disabled people. Disability awareness is provided to the disabled persons, public, governments, and NGOs. All must be involved in creating awareness about disability management. Different persons have different needs.

A person, who works with persons with visual impairment, may not be able to work with persons having other impairments. It is better to understand the need of each individual person with disability for providing better service.

As a first step, Planning is vital one to focus the strategy and implementation of successful program at the community level. This is huge role and there are many barriers, which must be recognized by the persons who work with disabled persons, so that realistic targets are planned. Capacity building of community is needed so that they take more active role.

Implementing agencies from outside should be seen only as catalysts. Committees involving disabled persons are needed. At least 50 percent of members being disabled persons are needed. Communities may not be uniform but divided by socio-economic status, other factors like language etc. Participation of people may be equal in all communities.

Direct contact with people who have a disability is a key factor in fostering positive attitudes towards them. Positive attitudes towards people with disabilities would most likely develop when awareness programs address three key factors:

- Interactions between people with disabilities and people without disabilities must be based on experience as much as possible;
- There must be equal status in the relationship between the person with a disability and the person without a disability;
- Each person should be working towards a common goal.

In planning of an awareness program on disability, it is necessary to first of all decide the period to be taken by the awareness program. The implementation of the awareness program activities will go one or two weeks. Such a period demands a thorough planning process with clear objectives. The planning process of the awareness program must start at least a month before the first activity takes place. The awareness program period, the number of activities and the number of people to be involved will determine the time schedule for the planning process.

10.7. Organising and Conducting Disability Awareness Program

Various committees constituted for conducting disability awareness program are to function collectively with perfect coordination. Disability data is needed for creating awareness of the community and providing services. Volunteers may be seen as part of 'idealised' communities. Volunteers have fast turnover. The volunteers are very important for community involvement and should be encouraged. However, programs cannot run only with volunteers. Communities should be seen as grouping of interest groups. For disability issues, the interest groups should include disabled persons, their families, friends, neighbours, teachers etc.

Public awareness meetings would be conducted by arranging drama, music, poetry, dance etc. Press release is necessary to spread information about the awareness program conducted in specific place. The production of the various awareness materials (poster, leaflet, booklet, T-shirts, banners, newsletters, video, radio program and so on) must correspond with available resources. Leaflets for the general public must be written in the local language. To get the desired change in attitude among the general public towards persons with disabilities it is necessary to make use of the influential persons in the community like politicians, media personnel, health workers, community leaders, teachers, etc.

The awareness program might consist of: speeches on the living conditions of disabled people, the rights of disabled people and testimonies from disabled persons. The message can also be presented via music, poetry, drama and traditional dance. It is important that when songs or poems are being composed by the artists it is very vital to ensure that lyrics used do not portray the image of disabled people wrongly. It should not portray disabled people as objects of pity, helpless and needing charity and handouts.

Finally, evaluation should be done to know how the program is effective, whether it served the purpose.

Psychology of Awareness Programmes

Awareness programs are conducted to make the public understand the themes that are helpful for their life. While planning awareness programs, we have to analyse as to for whom these programs are conducted; whether these programs make an impact on their life. Disability awareness programs are to be conducted in the community after well planning and organization. First of all, we should know the needs and wants of the people in the particular community. We should collect the information about the statistics and status of the persons with disabilities in the community. In some places, we find more leprosy patients living. In some families, parents and children are suffering from visual impairment. Awareness about disability is there in some places where voluntary organizations may be working for the persons with disabilities. All this information is to be collected to conduct the awareness programs on disability.

Check your Progress - 1

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

1. What do you mean by community mobilization?

....

....

2. State the need and importance of community mobilization for disability.

10.8. AWARENESS PROGRAMS FOR DISABILITY USING MASS MEDIA

Media selection is very important in conducting awareness program on disability at the community. Both print and visual media are used for the awareness programs. Appropriate communication media for the general public are: TV, radio, slideshows, posters, street theatre etc.

The volunteers can use various media to create awareness among public towards disability. They should take the training at their institutions on using various media for creating disability awareness in the community.

10.8.1. Arts

Arts, in general, the folk arts are very common in creating awareness programmes. Folk arts are the visual arts, music, dance, or literature originating from, or traditional to, the common people of a country. Folk arts usually reflect their traditional culture. They also tend to be applied art — artistic objects which also have some practical use. Folk arts tend to involve things like pottery, woodworking, and fabric work.

To create awareness about disability among the public, the artistic work of the persons with disabilities may be displayed, or the artistic works/acts related to disability issues may be exhibited/screened. Folk arts are arranged in such a way as to create awareness about disabilities. The following are some of the folk arts used for disability awareness in the community.

Kummi: It is one of the important ancient forms of village dances of Tamilnadu. The women stand in a circle and dance clapping their hands rhythmically to lifting songs. The first line of the song is sung by the leading

lady, which the others repeat. Songs related to disability issues may be used in this kummi dance.

Oyilattam: Oyilattum is an ancient folk-dance form in Tamilnadu. Oyil means beauty. This dance is hence the dance of beauty. This dance is performed by men. First a few people will stand in a row and start dancing with rhythmic steps with musical accomplishment. Then the row will become longer as the new comers join and dance. The dancers wear ankle-bells. Stories and episodes centering round disabled people are depicted in the songs.

Thappaattam: Thappu is the name of a rhythmic beat instrument. The subtle form of dance accompanied by captivating music is an ancient rural folk art which is even now popular in urban slum areas of Tamilnadu.

Puppet show: Puppet show is one of the famous folk arts. Many different kinds of puppets are used for this show - cloth, wood, leather etc. They are manipulated through strings and wires. The persons stand behind a screen and the puppets are held in front. The stories enacted in the puppet shows are related to disability issues for creating disability awareness among public.

Villu Pattu: The main singer is accompanied by a chorus, musical instruments and a main instrument, the Villu or Bow, fixed with bells. The villu is struck rhythmically when the bells jingles in tune. The main singer relates a tale, interspersed with lively songs. Generally folk arts are a result of ordinary people expressing themselves through their creation and construction of utilitarian objects that convey meaning and value to themselves or others within their community. Typically, the patterns, motifs, techniques and materials have special significance and can reveal a great deal about a cultural society.

Folk arts media can be effectively used for creating awareness. The students can make/collect paintings, sculpture, basketry etc., and perform folk dance with songs to create awareness about disability.

10.8.2. Music

Music is an art form and cultural activity whose medium is sound organized in time. Music include common elements such as pitch (which governs melody and harmony), rhythm (and its associated concepts tempo, meter, and articulation), dynamics (loudness and softness), and the sonic qualities of timbre and texture. Music is performed with a vast range of instruments and vocal techniques ranging from singing to rapping; there are solely instrumental pieces, solely vocal pieces (such as songs without instrumental accompaniment) and pieces that combine singing and instruments. The creation, performance, significance, and even the definition of music varies according to culture and social context. There are many types of music, including popular music, traditional music, art music, music written for religious ceremonies and work songs such as chanteys. In many cultures, music is an important part of people's way of

life, as it plays a key role in religious rituals, rite of passage ceremonies (e.g., graduation and marriage), social activities (e.g., dancing) and cultural activities ranging from amateur karaoke singing to playing in an amateur funk band or singing in a community choir. People may make music as a hobby. Since they feel relaxed while listening to music, most of the people are very much interested in it. Music therapy helps clients to improve and maintain health. Theme based songs make a good impact in the society. Songs composed on themes related to disability sensitize and create awareness among the public about disability and rehabilitation. Sometimes professional singers who are popular in the society may sing an awareness song and this can be done as a live concert or propagated through other social media. Musicians are invaluable partners in community engagement. Without their expertise, willingness and good humour much of the work would be impossible! Thus, music plays an inevitable role in creating awareness for disability.

10.8.3. Puppetry

Puppetry means the art of making puppets and presenting puppet shows. Puppet theatre is the most effective method of community awareness. The people from the target community relate themselves with puppet very well. The artist uses a variety of puppets to play out the story. While operating the puppets, the puppeteer narrates the story and through the story message is conveyed. The puppets used are very beautiful and colourful. The music and songs used in the story are very catchy. The advantages of puppet theatre are:

- It is a very low-cost medium.
- It does not require large space.
- The time and efforts required are minimal.

There are different types of puppets popular among puppeteers like glove puppets, string puppets, sting-rod puppets, rod puppets, shadow puppets etc.

For preparing the script, it is to be kept in mind that our main goal is to sensitize the community which includes discouraging the spread of superstitions in the community about disability.

This is an opportunity to educate illiterate persons in the community about the causes of disability and above all to change negative attitudes towards the disabled persons. Hence, the characters like doctors, midwives, mothers etc., are chosen so that they would share the message on non-discrimination and inclusion of the disabled at all levels.

This puppetry show is done with the help and act of puppeteers. The puppeteers are also made aware of disability to create new songs and puppets. The puppeteers' team generally consists of three persons. The master operates the puppets; the percussionist plays the music; and the singer sings and narrates the story. After the story is presented, a question and

answer session are followed. This would create awareness about disability and disability management.

10.8.4. Theatre and Street Theatre

Street theatre as a form of communication is deeply rooted in the Indian tradition. In recent times this form has been used to propagate social and political messages and to create an awareness amongst the masses regarding critical issues. Street theatre breaks the formal barriers and approaches the people directly.

It is possible to meet them in the most unexpected places – behind the vegetable complex in the market place, during evening walk, at the bus stop or perhaps even on the street in front of the office- a group of people, acting out a short skit or play, for anyone who might wish to stop and watch. They are not just philanthropists providing free entertainment. For them this is a means of reaching people of all strata and creating an awareness of events around them, calling them to change what they believe are the social ailments. These are the street theatre 'activists.'

Street theatre is a situation where the audience has not come prepared to watch a play, and people may not have much time on hand. These limitations determine the parameters of the plays. They are short. The exchange is close, direct and intimate and, to be more effective, usually loud and larger than life. The script and direction is always significant. In order to draw crowds from all walks of life, the plays are humorous. Songs based on popular catchy tunes are included to add to its appeal. The choreography of the play varies from script to script. The play must be as inexpensive and mobile as possible, since no stage props can be used. Street theatre actors are mainly teachers and students committed to bringing about social change. The time that this form of theatre demands is considerable. All evenings and weekends are spent rehearsing or performing.

A 'dholak' or choral song is used to attract people and once a large enough crowd has gathered the play being usually in a circular area with the audience all around. The chorus sings or speaks out the script.

Sometimes one person narrates while the actor's mime. No make-up is used unless mime is the medium. Then the face is painted white and the eyes an exaggerated black to highlight expressions. If the audience is very large and one person alone has to speak, a mike is used. There are no separate costumes for the actors. They might all wear a black robe but that depends on the theme. Being the kind of theatre, it is there is not much scope for fine acting. The movements have to be much exaggerated.

Impact of Street Theatre

If the communication has been worthwhile then there must be some tangible impact. What is important is that the plays make the people think. The play is seen by many people of different age groups who then question and discuss the contents of the play. This evocation of questioning is by itself

an impact. Thus, street theatre as a channel of communication is deeply rooted in Indian society. The modern form is different only in the themes enacted. The street theatre groups analyse the society as it exists, visualize its future, and then attempt to put the vision across. It plays a vital role in creating awareness among the general public with regard to disability and rehabilitation.

10.8.5. Role-Play

Role-playing is performed for changing one's behaviour towards disability. Through role-play, the awareness can be created on avoidance of stereotype attitude towards persons with disabilities, prevention of disabilities, educating disabled children, rehabilitation of the disabled persons and so on.

Example is given here for conducting role-play program in the classroom. Two students assume two main characters, Shankar who has cerebral palsy and Babu who has a visual impairment. Babu asks several questions to Shankar how he can move in the environment. The same question is asked by Shankar to Babu. Both of them elaborate on how they can move in the environment with or without the support of other persons. They also explain what physical and social barriers are encountered by them. They enjoy telling the peer group about all the things they can do, and they're honest in their feelings when they talk about things they can't. This show allows other students to understand that Shankar and Babu may have a disability, and they often encounter many physical and social barriers, but in most ways, they are just like everyone else; they like watching TV and playing sport, they even have to do homework.

Role-play allows students to understand how both the daily physical and social barriers can affect Shankar and Babu. They also get to explore how to make their environment more accessible for a person with disability.

10.8.6. Dance

Dance programs also play a role in changing the attitude of public towards disability. 'Ability Unlimited' is a professional dance troupe of disabled people in India. The troupe provides training and employment opportunities for its members. It exposes the artistic capacities of people with disabilities. The troupe has around 150 performers. They perform a dance repertoire including traditional Indian folk tales "martial arts on wheels" performances of Thang (a Manipuri martial art with swords), stories of the life of Buddha and other material. Feedback from the viewers indicates positive impacts on their perceptions of people with disabilities and their capacities, including among parents of the performers themselves.

Sudha Chandran is a famous Indian dancer, who has also obtained a Master’s Degree in Economics. She suffered the amputation of her right leg following an accident when travelling between Mumbai and Chennai in India. She received an artificial leg which allowed her to become one of the

most accomplished dancers in India. She now performs all over the world and has appeared in films and television shows.

The students can also perform dance. They can practice dance by sitting in wheelchair, tying one leg below the knee, backside or blindfolded. Dance performance may be given by students with attractive songs which show that the disabled people can also perform such dance programs if they are trained. Role models like Sudha Chandran may be brought to the light to understand their talents.

10.8.7. Drama

Drama is a play of events in real life that is intended for representation by actors impersonating the characters and performing the dialogue and action.

For example, A drama is acted by four students.

Two students act as father and mother (Ramu and Latha).

One person is a counsellor (Shiva).

Another person is a public (Gopal).

Ramu and Latha have a son with mental retardation. This 6-year-old child is not exposed to outside due to his disability by their parents.

The Counsellor Mr. Shiva goes to the village and enquires about the disabled children in the village.

Shiva (Meets Gopal) Sir, I am a counsellor. I am helping the families who have children with disabilities. I want to know whether any child with disability is living in your village.

Gopal: One child is there in that house. You please talk with them.

(Shiva goes to Ramu's house)

Shiva :(After introducing himself, he asks Ramu and Latha) "Is any child in your family suffering from disability?"

Ramu & Latha : We do not have any child.

Shiva : I heard that you have a child. I want to help you in the development and education of your child. Tell me, do you have a child?

Ramu & Latha: No, No. We don't have a child.

(After five days, he comes back to Ramu's house)

Shiva: The Government provides money, clothes, and transportation for all children to go to school. In your neighbouring village, one MR child and one blind child are educated in the Government School. These children are dressed up well and going to school for studying along with non-disabled children.

Ramu: How blind and MR Children can study? Are you joking?

Shiva: I am telling the truth. (He shows photographs) You see these photographs. How these children are in the classroom.

Latha: It is a waste to send these handicapped children to the school. They cannot manage themselves outside home.

Shiva: Not like that. All children have some talents and potentialities. When these disabled children move with other children, they get socialization, communication abilities, good mannerism and do some works independently.

Latha: I am sorry; we have a 6-year-old child. He is not normal. He does not understand what we tell. We have to do all things for him, for e.g., brushing, bathing, combing, feeding etc.

Shiva: Don't worry. We will train him. He will also go to school.

(In this drama, it is revealed that parents are ignorant of disability management. After the counselling, they understand that disabled children can also get education)

Check your Progress -2

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

3. List the various mass media through which awareness on disability could be given.

....

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10.8.8. Exhibition

Exhibition is a public show where art or other interesting things are put so that people can go and look at them. The exhibition may aim to provide the latest services, resources, products and information for individuals with developmental, sensory, emotional or physical disabilities. Exhibition should include photographs, articles, and contributions of the eminent people with disabilities. It should also include policies, programs, concessions etc., available for the persons with disabilities. Aids and appliances, devices, teaching-learning materials, technology for the disabled etc., should be exhibited.

Visitors can learn phrases in American Sign Language, type their names in Braille, try a hand-pedalled cycle, wear a blindfold on a multi-sensory "City Walk," try a wheelchair on a ramp, and more. Throughout the exhibit, individuals living with disabilities may be introduced with their accomplishments, and how they overcome challenges in their lives. In the exhibition, exhibit showcases may have the collections of the talents of local artists with disabilities.

The students should organize the exhibition with the guidance of the professors and the professionals in the field of special education and rehabilitation of the disabled. Announcement about the exhibition should be made at least two weeks before so that the nearby institutions and public can also visit the exhibition. If possible, the exhibition may be set in the mobile van. The van should go around the nearby villages. The people of the villages would see the exhibition and get benefit out of it.

10.8.9. Posters Display

Poster is a large, usually printed placard, bill, or announcement, often illustrated, that is posted to advertise or publicize something. A display is an arrangement of things that have been put in a particular place, so that people can see them easily. Many posters are to be displayed at various nodes to spread the awareness about disability. Posters display includes the colourful pictures and appropriate wordings relevant to the theme. Posters display also depicts the valuable contributions of people with disability.

Posters are written in local languages and pictures are relevant to the particular places. The posters have to reflect the social aspects of the particular society. Illiterate people understand the theme of the posters, only through the pictures, so, the pictures should be clear and should reveal what they intend to express.

10.9. LET US SUM UP

The sensitization towards disability aims to break the stigma through education, working to foster greater inclusiveness for PWDs in society and to promote disability rights. This sensitization could be achieved through various awareness programmes. Awareness programs are conducted to make the public understand the themes that are helpful for their life. While planning awareness programs, we have to analyse as to for whom these programs are conducted; whether these programs make an impact on their life. Awareness about disability is there in some places where voluntary organizations may be working for the persons with disabilities. Each disability awareness program has its own theme and is to be planned systematically; organized orderly, conducted effectively and evaluated objectively. The best practices in the disability awareness programs may be shared through print media and/or Internet.

10.10. UNIT – END EXERCISES

1. Why sensitization is considered necessary with regard to disability?
2. What is meant by community mobilization? State its need and importance.
3. Mention the significance of awareness programmes for disability.
4. Explain how will you organise and conduct awareness programme for disability.
5. Describe the various awareness programmes using mass media for disability.

10.11. ANSWERS TO CHECK YOUR PROGRESS

1. Community mobilization is the process of bringing together as many stakeholders as possible to raise people's awareness of and demand for a particular programme, to assist in the delivery of resources and services, and to strengthen community participation for sustainability and self-reliance.
2. Need and Importance
   - Communities are aware about the needs, and motivated to improve the quality of life, of people with disabilities and their family members.
   - Barriers in the community are reduced or removed for people with disabilities and their family members.
   - Communities are knowledgeable about Community Based Rehabilitation and how community resources can be used to develop and sustain CBR programmes.
3. Awareness programs for Disability can be given using Mass Media such as Folk arts, music, puppet show, theatre arts, dance, drama, exhibition, poster display, role play etc.

10.12. SUGGESTED READINGS

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UNIT XI: APPROACHES TO THERAPEUTIC REHABILITATION SERVICES

STRUCTURE

11.1. INTRODUCTION

Rehabilitation is the process of removing, or reducing as far as possible, the factors that limit the activity and participation of a person with disability, so that he/she can attain and maintain the highest possible level of independence and quality of life: physically, mentally, socially and vocationally. Rehabilitation is always voluntary, and some individuals may

require support with decision-making about rehabilitation choices. In all cases rehabilitation should help to empower a person with a disability and his or her family. To achieve full inclusion, many different interventions may be needed, which, depending on the individual's type of disability may include one or several of the following: Medical care, Supply of assistive devices, Therapy (physical and occupational), Psychosocial services, Social support, Education (inclusive and special), Job placement, Support for economic self-reliance, Eradication of physical, social and financial barriers. This unit outlines the approaches to therapeutic rehabilitation services which include neuro developmental therapy, physical therapy, occupational therapy, speech therapy, O&M training, visual and speech perceptual training, adaptive mobility devices and medications.

11.2. OBJECTIVES

After reading this unit, the reader shall be able to

- Acquire knowledge about the various therapeutic rehabilitation services.
- Understand the applications of various therapies.
- Comprehend the utilization of various adaptive mobility devices.
- Realize the necessity of medications in rehabilitation.

11.3. APPROACHES TO THERAPEUTIC REHABILITATION SERVICES

Rehabilitation

Rehabilitation in its fullest sense necessitates, on the one hand, maximizing the physical and mental fitness of individuals and their capacity to work and to enjoy life, through interventions ranging from the medical and paramedical to counselling and vocational training and job placement; and, on the other hand, promoting the accessibility and openness of the physical and social environment to people with impairments. The focus of rehabilitation on the individual rather than on the wider community and the physical environment has major implications.

It helps to keep the problems hidden from the public eye, so that policy makers, planners, politicians and others are less likely to take the needs of people with disabilities into account. Because the problem is seen to lie within the individual and in her/his limitations, the solution must also logically be sought at this level, that is, in individual adjustment, rather than in environmental accommodation or modification.

Rehabilitation measures target body functions and structures, activities and participation, environmental factors, and personal factors. They contribute to a person achieving and maintaining optimal functioning in interaction with their environment, using the following broad outcomes:

- Prevention of the loss of function
- Slowing the rate of loss of function
- Improvement or restoration of function
- Compensation for lost function
- Maintenance of current function.

Rehabilitation outcomes are the benefits and changes in the functioning of an individual over time that are attributable to a single measure or set of measures.

Therapy

Therapy is concerned with restoring and compensating for the loss of functioning, and preventing or slowing deterioration in functioning in every area of a person's life. Therapists and rehabilitation workers include occupational therapists, orthotists, physiotherapists, prosthetists, psychologists, rehabilitation and technical assistants, social workers, and speech and language therapists. Therapy measures include: training, exercises, and compensatory strategies, education, support and counselling, modifications to the environment, provision of resources and assistive technology, etc.

Some therapy measures improve rehabilitation outcomes. For example, exercise therapy in a broad range of health conditions – including cystic fibrosis, frailness in elderly people, Parkinson disease, stroke, osteoarthritis in the knee and hip, heart disease, and low back pain – has contributed to increased strength, endurance, and flexibility of joints. It can improve balance, posture, and range of motion or functional mobility, and reduce the risk of falls. Therapy interventions have also been found to be suitable for the long-term care of older persons to reduce disability. Some studies show that training in activities of daily living have positive outcomes for people with stroke.

Approaches to Therapeutic Rehabilitation Services

There are many approaches to rehabilitation therapy, each designed to address specific ranges of issues. What they all have in common is their primary goals: To help individuals recover from illness, injury, surgery, stroke, cardiac events or other medical issues and regain functional abilities and independence lost to these events.

The various therapeutic rehabilitation services include neuro developmental therapy, physical therapy, occupational therapy, speech therapy, O & M training, visual & speech perceptual training and rehabilitation medications.

Physical Therapy – This type of rehabilitation therapy works to improve movement dysfunction. Therapists work with patients to restore movement, strength, stability and/or functional ability and reduce pain via targeted exercise and a range of other treatment methods.

Occupational Therapy – This form of therapy focuses on restoring an individual's ability to perform necessary daily activities. This may mean working to improve fine motor skills, restore balance, or assist patients in learning how to increase their functional ability via use of adaptive equipment, among other potential treatment options.

Speech Therapy – This type of rehabilitation therapy is used to address difficulties with speech, communication and/or swallowing.

Respiratory Therapy – Used to aid patients who have breathing disorders or difficulties, this form of rehabilitation therapy works to help them decrease respiratory distress, maintain open airways and, when necessary, learn how to use inhalers and supplemental oxygen properly

Cognitive Rehabilitation – Also commonly called cognitive-behaviour rehabilitation, this type of therapy works with patients to improve memory, thinking and reasoning skills.

Vocational Rehabilitation – This form of therapy is geared towards preparing individuals to return to work after an injury, illness, or medical event.

Each type of rehabilitation therapy can be accessed in various healthcare settings. These include inpatient rehabilitation facilities, outpatient rehabilitation clinics and home-based rehabilitation services.

Inpatient rehabilitation centers typically offer all of these common types of therapy and others, along with medical/nursing care, provided by a multidisciplinary team of rehabilitation professionals in a hospital-type setting. Outpatient clinics vary in the types of therapy they offer, and those services are offered by appointment, with patients traveling to their offices for therapy sessions. Home-based rehabilitation programs typically offer a few basic services – usually physical, occupational, and speech therapies – in a patient's home, with therapists visiting by appointment.

When multiple types of therapy are needed to aid an individual in recovery and rehabilitation or close medical supervision is necessary, seeking services in an inpatient facility is generally recommended as the safest and most efficient means of treatment. Outpatient or home-based services may be most appropriate for patients who need fewer services or less intensive medical/rehabilitative care. These services are provided by a number of different health care providers and specialists, including (but not limited to):

- Physiatrists (also called rehabilitation physicians)
- Occupational therapists
- Physical therapists
- Cognitive rehabilitation therapists
- Gait and clinical movement specialist
- Rehabilitation technologists
- Speech therapists
- Audiologists
- Orthopaedists/surgeons
- Neurologists
- Psychiatrists/psychologists
- Biomedical engineers
- Rehabilitation engineers

Check your Progress -1

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

1. What is rehabilitation?

....

2. List the various therapeutic rehabilitation services.

....

Let us discuss each of these therapeutic rehabilitation services in detail.

11.4. NEURO DEVELOPMENTAL THERAPY

Neurodevelopmental therapy (NDT) is a hands-on treatment approach used by physical therapists, occupational therapists, and speech-language pathologists. NDT was developed to enhance the function of adults and children who have difficulty controlling movement as a result of neurological challenges, such as cerebral palsy, stroke, and head injury.

The concept of neuro-developmental treatment (NDT) was evolved empirically by Bertha Bobath and Karel Bobath. They tried to find its theoretical explanations. NDT is a holistic approach dealing with the quality of patterns of coordination and not only with the problems of individual muscle function. It involves the whole person, not only his sensory-motor problems but also problems of development, perceptual-cognitive impairment, emotional, social and functional problems of the daily life as well.

Neurodevelopmental treatments are an advanced therapeutic approach practiced by experienced occupational therapists for the rehabilitation of children with cerebral palsy.

The primary challenge in children with cerebral palsy is gross motor dysfunction. In children with cerebral palsy (CP), lesions of the central nervous system (CNS) could cause motor-sensory impairments that progressively deteriorate over time. CP occurs in every 2/1000 and up to 2.5/1000 live births. The primary challenge for CP is gross motor dysfunction (GMD). In addition, the severity of limitation in gross motor function (GMF) among children with CP, the most common physical disability is highly variable. The motor problems of CP arise fundamentally from CNS dysfunction, which interferes in the development of normal postural control against gravity and impedes normal motor development. Occupational therapy in children with CP is performed to avoid abnormal muscle tone and posture, to treat muscle and joint deformities, and to reduce motor and sensory disorders. This approach for neurodevelopmental treatment for CP is the most widespread and is clinically accepted for targeting the CNS and the neuromuscular system. In view of the specific lesions in the CNS that ‘teaches’ the brain to improve motor performance skills and achieve ‘as near normal function as possible. The primary purpose of this approach is to correct abnormal postural tone and to facilitate more normal movement patterns for performing performance skills. Neurodevelopment Therapy (NDT) is widely used by paediatric therapists in the treatment of children with CP. In NDT, each session includes exercises for patients sustaining themselves on their forearms and hands, sitting, crawling, semi-kneeling, and in standing positions supported by the occupational therapist until tone reduction was achieved. Balance and corrective reactions were developed by using a CP ball and tilt board after the children had acquired the skill of maintaining exercise positions. Ambulation training, appropriate to the motor development level (crawling, creeping, walking while in a semi-kneeling position, and walking between parallel bars) was given. Additionally, for this study, the NDT programme included passive stretching of the lower limb muscles (e.g. hamstrings, gastrosoleus), followed by techniques of reducing spasticity and facilitating more normal patterns of movement while working on motor functions.

This treatment approach makes it possible for occupational and speech therapists each to play an important part in the team, as well as parent participation in education and guidance. The characteristic syndromes of cerebral palsy are the result of abnormal sensory-motor development and appear gradually. If we start to treat the child in the period when abnormal patterns of posture and movement are already fully established and habitual, we can achieve only limited results and we cannot avoid deformities and orthopaedic surgical interventions. Early NDT treatment is considered to be the treatment that starts at the age of two to three months (corrected age), that is before anti-gravity voluntary movements emerge and abnormal movement patterns begin to be predominant. With early treatment we have the chance to integrate active normal sensory-motor experiences before abnormal movement patterns have become a habit.

NDT is in practice a successful approach but we should not think that we can cure a brain lesion or cerebral palsy, or that we can change all cases to only "minimal" cerebral palsy.

This therapy uses guided or facilitated movements as a treatment strategy to ensure correlation of input from tactile, vestibular, and somatosensory receptors within the body. NDT was developed with the understanding that patients with brain injuries have a limited repertoire of movement patterns. During treatment interventions, repeated experience in movement ensures that a particular pattern is readily accessible for motor performance. The more a patient performs certain movements, the easier these movements becomes. Without NDT interventions, the patient likely will develop a limited set of movement patterns that he or she will apply to nearly all tasks. NDT should begin before such generalized movement synergies become hard-wired in the patient's brain.

Therapists trained in NDT have completed advanced training that enables them to properly assess and treat the variety of neuro-motor problems experienced by these individuals and help these individuals become as functional and independent as possible. NDT-trained therapists work collaboratively with patients, their families and caregivers, physicians, and other members of the rehabilitation team to develop and implement a comprehensive treatment program for each person that is based on scientific principles and current research.

11.4.1. The NDT Concept Today

The basic principles of NDT remain the same. By the inhibitory control of abnormal movement patterns and simultaneous facilitation of automatic postural reactions (righting and equilibrium reactions) with the therapist's hands combined with different techniques of stimulation, we reduce the dysfunctional abnormal postural tone to facilitate and transmit to the child a variety of sensory-motor experiences in functional and goal directed activities. The therapist controls proximal key points of control (head, shoulders, trunk and pelvis) to achieve a good for each child individually adapted, a mobile control of the posture. In the early treatment we can facilitate righting and equilibrium reactions close to the sequences of normal development. In an older child we have to compromise, and find and transmit the essential basic patterns, which are needed to improve the child's activities in the present and near future. The treatment is, therefore, adapted to the needs of the individual child. The child's abilities and

disabilities are carefully assessed and the child is handled and treated in a specialized way, observing and controlling his responses. There is a necessity for a constant interaction with assessment and reassessment during the treatment (Bobath, 1987; Mayston, 1992).

Cerebral palsy is long-life, but improves with adequate intervention. NDT is in practice a successful approach but we should not think that we can cure a brain lesion or cerebral palsy, or that we can change all cases to only "minimal" cerebral palsy.

If the treatment is started before abnormal patterns of movement have become established, we can help the child to organize his potential abilities in what for him is the most normal way.

11.5. PHYSICAL THERAPY (PT)

This type of rehabilitation therapy works to improve movement dysfunction. Therapists work with patients to restore movement, strength, stability and/or functional ability and reduce pain via targeted exercise and a range of other treatment methods. It involves activities and exercises to improve the body's movements, sensations, strength, and balance.

PT is a healthcare specialty that includes the evaluation, assessment, and treatment of individuals with limitations in functional mobility. Physical therapy services are provided by physical therapists, who are professionals licensed by the state in which they work. Physical therapists (or PTs, as they are commonly called) are required to have a master's degree or a clinical doctorate degree from an accredited institution and must sit for a licensing exam to practice.

Physical therapists are trained to assess your condition and help you regain maximal functional mobility and independence. They use a variety of treatment modalities and techniques to help you move better and feel better; treatment is very personalized.

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11.5.1. Who Needs Physical Therapy?

An individual having an injury or illness that results in pain, physical impairment, or limited normal movement/loss of function, can seek the help of a physical therapist. Physical therapists treat people across the entire lifespan. Many PTs specialize in treating a certain population, like children, the elderly, or athletes. Regardless of age, if you have impaired mobility, a physical therapy evaluation may be warranted to offer treatment and a strategy to improve function.

Some common problems that physical therapists evaluate and treat include:

- Stroke
- Fractures
- Spinal cord injury
- Carpal tunnel syndrome
- Sports injuries
- Amputations
- Arthritis

When an injury or illness occurs that limits your ability to move about safely or normally, a referral to a physical therapist may be made. Physical therapists work closely with patients, doctors, and family members to ensure

safe and rapid return to maximal function. Physical therapists can also help you *prevent* injury or loss of functional mobility.

11.5.2. Where to Get Physical Therapy?

Physical therapists work in a variety of different settings. Anywhere you may encounter a person who may be having difficulty with normal mobility is where you may find a physical therapist, including:

- In the hospital
- In nursing homes
- In outpatient clinics
- With sports teams
- In schools
- In your home (if you are unable to leave due to illness or injury)
- In cardiac rehab centers

11.5.3. Evaluation by a Physical Therapist

When you first visit a physical therapist, he or she will evaluate and assess your overall condition. He or she may take specific measurements to gather information about your illness or injury. Impairments typically measured may include:

- Strength
- Range of motion
- Flexibility
- Balance
- Joint mobility
- Neurological function
- Pain
- Cardiac function
- Pulmonary function
- Overall functional mobility

After gathering information about the injury or illness, the PT will make a prognosis of the patient's condition and can offer strategies to help move better and feel better. The PT will discuss the goals for physical therapy and work with the patient to develop a treatment plan for rehabilitation.

11.5.4. Physical Therapy Treatments

Physical therapists use many different techniques to help decrease pain and stiffness, improve motion and strength, and improve mobility. Physical agents such as heat, ice, ultrasound, or electrical stimulation may be used. Manual techniques are often used to help improve mobility.

Therapeutic exercise is often used by physical therapists to help people gain range of motion, increase strength, and improve function. Patient education about a condition or illness is paramount to the practice of physical therapy, and therapists may use charts, models, and diagrams to help you understand your diagnosis and prognosis. The patient may also be given modifications to make or exercises to do at home.

11.5.5. Benefits of Physical Therapy

1. **Reduce or eliminate pain.** Therapeutic exercises and manual therapy techniques such as joint and soft tissue mobilization or treatments such as ultrasound, taping or electrical stimulation can help relieve pain and restore muscle and joint function to reduce pain. Such therapies can also prevent pain from returning.
2. **Avoid surgery.** If physical therapy helps to eliminate pain or heal from an injury, surgery may not be needed. And even if surgery is required, you may benefit from pre-surgery physical therapy. If you are going into a surgery stronger and in better shape, you will recover faster afterwards in many cases. Also, by avoiding surgery, health care costs are reduced.
3. **Improve mobility.** If you're having trouble standing, walking or moving, no matter your age, physical therapy can help. Stretching and strengthening exercises help restore your ability to move. Physical therapists can properly fit individuals with a cane, crutches or any other assistive device, or assess for orthotic prescription. By customizing an individual care plan, whatever activity that is important to an individual's life can be practiced and adapted to ensure maximal performance and safety.
4. **Recover from a stroke.** It's common to lose some degree of function and movement after stroke. Physical therapy helps strengthen weakened parts of the body and improve gait and balance. Physical therapists can also improve stroke patients' ability to transfer and move around in bed so that they can be more independent around the home, and reduce their burden of care for toileting, bathing, dressing and other activities of daily living.
5. **Recover from or prevent a sports injury.** Physical therapists understand how different sports can increase your risk for specific types of injuries (such as stress fractures for distance runners). They can design appropriate recovery or prevention exercise programs for you to ensure a safe return to your sport.
6. **Improve your balance and prevent falls.** When you begin physical therapy, you will get screened for fall risk. If you're at high risk for falls, therapists will provide exercises that safely and carefully challenge your balance as a way to mimic real-life situations. Therapists also help you with exercises to improve coordination and assistive devices to help with safer walking. When the balance problem is caused by a problem in one's vestibular system, Physical therapists can perform specific maneuvers that can quickly restore proper vestibular functioning, and reduce and eliminate symptoms of dizziness or vertigo.
7. **Manage diabetes and vascular conditions**. As part of an overall diabetes management plan, exercise can help effectively control blood sugar. Additionally, people with diabetes may have problems with sensation in their feet and legs. Physical therapists can help provide and educate these patients on proper foot care to prevent further problems down the road.
8. **Manage age-related issues.** As individuals age, they may develop arthritis or osteoporosis or need a joint replacement. Physical

therapists are experts in helping patients recover from joint replacement, and manage arthritic or osteoporotic conditions conservatively.

9. **Manage heart and lung disease.** While patients may complete cardiac rehabilitation after a heart attack or procedure, you also may receive physical therapy if your daily functioning is affected. For pulmonary problems, physical therapy can improve quality of life through strengthening, conditioning and breathing exercises, and help patient's clear fluid in the lungs.
10. **Manage Women's Health and other conditions.** Women have specific health concerns, such as with pregnancy and post-partum care. Physical therapists can offer specialized management of issues related to women's health. Additionally, PT can provide specialized treatment for: Bowel incontinence, breast cancer, constipation, fibromyalgia, lymphedema, male pelvic health, pelvic pain, and urinary incontinence.

11.6. OCCUPATIONAL THERAPY

This form of therapy focuses on restoring an individual's ability to perform necessary daily activities. This may mean working to improve fine motor skills, restore balance, or assist patients in learning how to increase their functional ability via use of adaptive equipment, among other potential treatment options.

Occupational Therapy (OT) is a health profession recognized by law (Law 44/2003 of 21 November on the Regulation of Health Professions); entry to occupational therapy practice requires specific university-level education. Occupational therapists, as members of transdisciplinary teams working in health and social settings, have direct contact with people with different types of disabilities, different levels of dependency or functional limitations, and/or with people who are restricted in their social participation; therefore, the implementation of OT interventions has a direct effect on the health, personal autonomy, and quality of life of people.

Occupational therapy occupies a privileged position in the rehabilitation process: when addressing activities of daily living (ADLs), it is necessary to coordinate physical, cognitive, emotional, and behavioural aspects to achieve the patient's highest level of function.

11.6.1. Role of Occupational Therapists:

"Occupational therapists are university graduates in occupational therapy responsible for implementing techniques and carrying out activities of an occupational nature to enhance or compensate for diminished or lost physical or cognitive functions, and to guide and increase development of such functions".

The term "occupation" is defined as such: "A group of activities that has personal and socio-cultural meaning, is named within a culture and supports participation in society. Occupation can be categorized as self-care, productivity and/or leisure." For an activity to be understood as therapeutic, it must have a series of characteristics, including the following:

11.6.2. Characteristics of OT

- Be goal-directed
- Be meaningful to the client
- Be a suitable tool for the prevention of dysfunction, maintenance or improvement of function, skill, and quality of life
- Promote client participation in activities of daily living
- Be determined by the occupational therapist professional judgment based on knowledge of the pathology, specific procedures, interpersonal relationships, and the specific value of such activity.

In view of the above aspects, occupational therapy can be defined as a set of techniques, methods and procedures to get through activities used for therapeutic purposes to prevent disability and maintain health, promote restoration of function, compensate for deficits and assess behavioural responses and their importance for achieving the individual's maximum level of independence in activities of daily living, both basic and instrumental, and the possible reintegration of the individual in each of several dimensions: physical, psychological, cognitive, emotional and social.

On the other hand, in 1968, the American Occupational Therapy Association (AOTA) defined occupational therapy as such: "The art and science of directing man's response to selected activity to promote and maintain health, to prevent disability, to assess behaviour, and to treat or train patients with physical or psychosocial dysfunctions."

11.6.3. Goals and Functions of Occupational Therapy

The generic goals pursued in the practice of occupational therapy are: disability prevention, health promotion (COTEC, 2012) and the achievement of an optimal level of functioning in those individuals whose function is reduced or impaired by injury, physical or mental illness, dysfunctional condition, developmental or learning disabilities or adverse contextual factors.

Occupational therapy includes four major concepts that define it as a profession and define the overall goals of its intervention:

- Occupational therapy is a health-related profession using selected activity to prevent and overcome many physical, emotional or social disabilities in people of all ages. The objective is to promote, maintain and/or restore functional independence in daily living skills.
- Occupational therapy is concerned with human occupation and its importance in health for persons of all ages. Occupational therapists evaluate the physical, psychosocial and environmental factors which reduce a person's ability to participate in everyday activities of occupation.
- Therapeutic objectives are achieved through techniques or activities designed to:
    - Diminish and control pathology
    - Restore and/or reinforce functional capacity
    - Facilitate learning of skills and function essential for adaptation to the environment
    - Promote and maintain health
- Occupational therapy is a health profession which teaches, maintains, and promotes competent behaviour in the areas of daily

living, learning and working to individuals experiencing illness, developmental deficits and/or physical and psychological dysfunction or who are otherwise at risk.

Promotion of health and well-being

Occupational therapy is a profession based on the promotion of health and well-being through occupation, which is its core concept, and whose primary goal is to enable people to participate in activities of daily living. To this end, occupational therapists have a broad education in the skills, abilities and capacities of humans related to their participation in a variety of activities and contexts, as well as in the interactions that occur between these elements in people with limitations or impaired body structures, which hinder their participation in the occupations of everyday life.

On the basis of the above, the roles of occupational therapists in the departments of physical medicine and rehabilitation include: re-education and training in the basic and instrumental activities of daily living; development, remediation, or compensation of cognitive, perceptual, neuromuscular, sensory-motor functions and behavioural skills, among others; the design, fabrication and training in assistive technology (adaptation and training in positioning devices and wheelchairs, for example); the evaluation, consultation, and application of ergonomic principles, and adaptation to physical and sensory environments (e.g.: architectural barriers, adaptation to the workplace environment, etc.).

Disability prevention

Occupational therapists provide services in disability prevention, activity limitation, and participation restriction. The primary goal of occupational therapy is to enable people to participate in the activities of everyday life. More specifically, the goals or aims of occupational therapy are:

- Disability prevention: occupational therapists help clients avoid problems in prevent occupational dysfunctions, prevent future injuries or diseases in occupational performance, and participate in projects and actions aimed at the prevention of disability at the community level.
- Evaluation of performance components of activities of daily living from a specific and global perspective: occupational therapists perform functional assessments of both joint range of motion and muscle strength, assess functional limitations, analyse everyday gestures, evaluate sensory, perceptual, cognitive and behavioural capacities related to activities of daily living, assess social skills and evaluate home and work environments.
- Maintenance, acquisition, improvement or restoration of the components of activities of daily living: improving mobility, strength, coordination, and dexterity; increasing pain threshold and pain tolerance; teaching compensation techniques for lost or impaired functions, range-of-motion exercises and energy conservation techniques; developing functional residual capacity; evaluating residual functional capacity; fabricating, fitting and

training in the use of prosthetic and orthotic devices; improving adherence to medical treatment; helping clients envision their possibilities for improvement and achievement of functional independence; working to maximize independence in activities of daily living; fabricating and training in assistive technology for both basic and instrumental activities of daily living, including the use of mobility devices such as wheelchairs, walkers, etc.; modifying/adapting the work environment; eliminating/adapting architectural barriers; helping clients live with their limitations by providing a realistic and optimistic vision of their new situation, as well as recommending and informing them about interests and occupations.

In short, occupational therapists assist disabled clients to maximize their functional capacities, develop functional residual capacities, compensate for their functional deficits, and achieve their reintegration into the community while achieving the greatest possible degree of independence.

11.6.4. OT vs PT: THE DIFFERENCE BETWEEN FIELDS OF OCCUPATIONAL THERAPY AND PHYSICAL THERAPY

The fields of occupational therapy and physical therapy are often confused. While both roles provide essential hands-on rehabilitative work to help clients perform everyday tasks as independently as possible, each field takes a diverse approach in helping people get back to their usual way of life.

The main difference between occupational therapy and physical therapy is that OT focuses on improving a client's ability to perform activities of daily living (ADL) and PT focuses on improving a client's ability to perform movement of the human body.

An occupational therapist treats the *whole* person. Whether they're recovering from injuries or have developmental or cognitive disabilities affecting their motor skills, emotions or behaviour, OTs are helping people to fully engage in daily life.

A physical therapist treats the patient's *actual* impairment from a biomechanical perspective. Physical therapy tries to improve the impairment itself by increasing mobility, aligning bones and joints, or lessening pain. A PT's primary goal is to get their patients back in motion with exercises, massage and other techniques. They focus on preventing injuries and can help people avoid surgery or a long term-reliance on medications.

Check your Progress -2

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

3. What is occupational therapy?

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4. Who needs physical therapy?

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11.7. SPEECH THERAPY

Speech therapy is an intervention service that focuses on improving a child's speech and abilities to understand and express language, including nonverbal language. Speech therapists, or speech and language pathologists (SLPs), are the professionals who provide these services. Speech therapy includes two components: 1) coordinating the mouth to produce sounds to form words and sentences (to address articulation, fluency, and voice volume regulation); and 2) understanding and expressing language (to address the use of language through written, pictorial, body, and sign forms, and the use of language through alternative communication systems such as social media, computers, and iPads). In addition, the role of SLPs in treating swallowing disorders has broadened to include all aspects of feeding.

Speech - language therapy is the treatment for most kids with speech and/or language disorders.

11.7.1. Speech Disorders, Language Disorders, and Feeding Disorders

A speech disorder refers to a problem with the actual production of sounds. A language disorder refers to a problem understanding or putting words together to communicate ideas.

Speech disorders include:

- Articulation disorders: difficulties producing sounds in syllables or saying words incorrectly to the point that listeners can't understand what's being said.
- Fluency disorders: problems such as stuttering, in which the flow of speech is interrupted by abnormal stoppages, partial-word repetitions ("b-b-boy"), or prolonging sounds and syllables (sssssnake).
- Resonance or voice disorders: problems with the pitch, volume, or quality of the voice that distract listeners from what's being said. These types of disorders may also cause pain or discomfort for a child when speaking.

Language disorders can be either receptive or expressive:

- Receptive disorders: difficulties understanding or processing language.
- Expressive disorders: difficulty putting words together, limited vocabulary, or inability to use language in a socially appropriate way.
- Cognitive-communication disorders: difficulty with communication skills that involve memory, attention, perception, organization, regulation, and problem solving.

Dysphagia/oral feeding disorders are disorders in the way someone eats or drinks, including problems with chewing, swallowing, coughing, gagging, and refusing foods.

11.7.2. Strategies of Speech Therapy

Therapists use a variety of strategies, including:

- **Language intervention activities**: The SLP will interact with a child by playing and talking, using pictures, books, objects, or ongoing events to stimulate language development. The therapist may also model correct vocabulary and grammar and use repetition exercises to build language skills.
- **Articulation therapy**: Articulation, or sound production, exercises involve having the therapist model correct sounds and syllables in words and sentences for a child, often during play activities. The level of play is age-appropriate and related to the child's specific needs. The SLP will physically show the child how to make certain sounds, such as the "r" sound, and may demonstrate how to move the tongue to produce specific sounds.
- **Oral-motor/feeding and swallowing therapy**: The SLP may use a variety of oral exercises — including facial massage and various tongue, lip, and jaw exercises — to strengthen the muscles of the mouth for eating, drinking, and swallowing. The SLP may also introduce different food textures and temperatures to increase a child's oral awareness during eating and swallowing.

11.7.3. Significance of Speech therapy

Kids might need speech-language therapy for a variety of reasons, including, but not limited to:

- hearing impairments
- cognitive (intellectual, thinking) or other developmental delays
- weak oral muscles
- chronic hoarseness
- birth defects such as cleft lip or cleft palate
- autism
- motor planning problems
- articulation problems
- fluency disorders
- respiratory problems (breathing disorders)
- feeding and swallowing disorders
- traumatic brain injury

Therapy should begin as soon as possible. Children enrolled in therapy early (before they're 5 years old) tend to have better outcomes than those who begin therapy later. This does not mean that older kids can't make progress in therapy; they may progress at a slower rate because they often have learned patterns that need to be changed.

11.7.4. Parental Involvement

Speech-language experts agree that parental involvement is crucial to the success of a child's progress in speech or language therapy.

Parents are an extremely important part of their child's therapy program and help determine whether it is a success. Kids who complete the program quickest and with the longest-lasting results are those whose parents have been involved.

Ask the therapist for suggestions on how you can help your child. For instance, it's important to help your child do the at-home stimulation activities that the SLP suggests to ensure continued progress and carry-over of newly learned skills.

The process of overcoming a speech or language disorder can take some time and effort, so it's important that all family members be patient and understanding with the child.

11.7.5. Types of Speech Therapy

Speech Therapy for Late Talkers

If your infant or toddler should be talking by now but isn't, he may be referred to a speech therapist. The therapist will likely try different things to encourage your child to talk, including playing with him. Sometimes, withholding a favourite toy until a child asks for it motivates small children to talk, but this depends on the circumstance.

For some children, other types of communication, such as sign language or picture cards, might be introduced. Speech therapists may also refer your child for further evaluation, such as hearing tests if necessary.

Speech Therapy for Kids with Apraxia

Children with apraxia have difficulty saying certain syllables or making certain sounds. Your child knows what he or she wants to say, but it doesn't seem to come out right. Speech therapists are qualified to evaluate children for apraxia by using several tests, including:

- Oral-motor assessment to check for muscle weakness in the jaw, lips or tongue
- Melody of speech assessment during which the therapist listens to see if they can appropriately stress certain syllables and use pitch and pauses at the appropriate place in a sentence
- Speech sound assessment which further determines how well the child can pronounce sounds, including vowels, consonants, and sound combinations. This includes determining how well others are able to understand the child's conversational speech

If your child is diagnosed with apraxia, they will probably need speech therapy on a one-on-one basis several times per week. This therapy will likely consist of intensive practicing their speech. The therapist will try to help your child understand auditory feedback as well as visual or tactile cues. One way a therapist might do this is to have your child look at

themselves in a mirror while speaking, or record them speaking and then playing it back. Many children enjoy this. Since successful treatment for apraxia involves a lot of time and commitment, your therapist may give you "assignments" to practice with your child at home.

Speech Therapy for Stuttering

Stuttering is a problem that usually develops during childhood but can develop during adulthood as well. Stuttering is usually considered a type of behavioural problem. Speech therapists will try to teach your child who stutters behavioural modification techniques that in turn may help control their stuttering.

A common method that may be used on your child is to teach them to control the rate of speech since speaking too quickly can make stuttering worse for some people. Practicing speech in a slower, more fluent manner can be helpful. It can also be helpful to monitor breathing. Even after treatment, people who stutter may require follow-up sessions with their speech therapist to keep the problem from recurring.

Speech Therapy for Aphasia

Aphasia is a condition that causes difficulty speaking as a result of some sort of damage to the brain. The condition can also consist of difficulty listening, reading, and writing. Aphasia happens to many adults after they have experienced a stroke. Speech therapists play a crucial role in diagnosing aphasia by evaluating an individuals' ability to understand others, express themselves, and even swallow. There are many different things a speech therapist might do to help a person with aphasia, including:

- Drills to improve specific language skills
- Group therapy to improve conversational skills
- Gestures and writing to augmenting their communication skills

Speech Therapy for Swallowing Difficulty

Your child may experience difficulty swallowing for a variety of reasons. A speech therapist may help your child with swallowing difficulty by assisting them with exercises to make her mouth strong, increase tongue movement, and improve chewing.

A speech therapist may also make recommendations about the consistency of food. For infants, a speech therapist may assist in coordinating her suck-swallow-breath pattern.

11.7.6. Benefits of Speech Therapy

Speech therapy can help kids learn to speak more clearly. This helps them feel more confident and less frustrated about speaking to others. Kids who have language issues can benefit socially, emotionally and academically from speech therapy.

For kids with reading issues such as dyslexia, speech therapy can help them hear and distinguish specific sounds in words: the word *bat* breaks down into *b*, *a*, and *t* sounds. This can improve reading comprehension skills and encourage kids to read.

Speech therapy is especially beneficial when kids begin early in life. In one study, 70 percent of preschool kids with language issues who went through speech therapy showed improvement in language skills.

Check your Progress -3

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

5. Mention the most common speech disorders.

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6. Write the speech therapy given for stuttering.

....

11.8. O & M TRAINING

Orientation and Mobility (O&M) is a profession specific to blindness and low vision that teaches safe, efficient, and effective travel skills to people of all ages:

- "Orientation" refers to the ability to know where you are and where you want to go, whether you're moving from one room to another or walking downtown for a shopping trip.
- "Mobility" refers to the ability to move safely, efficiently, and effectively from one place to another, such as being able to walk without tripping or falling, cross streets, and use public transportation.

An Orientation and Mobility (O&M) Specialist provides instruction that can help you develop or re-learn the skills and concepts you need to travel safely and independently within your home and in the community. O&M Specialists provide services across the life span, teaching infants and children in pre-school and school programs, as well as adults in a variety of community-based and rehabilitation settings.

The Academy for Certification of Vision Rehabilitation and Education Professionals (ACVREP) offers certification for vision rehabilitation professionals, including O&M Specialists. A Certified Orientation and Mobility Specialist (COMS) must adhere to a professional Code of Ethics and demonstrate knowledge and teaching skills in the following areas:

- Sensory development, or maximizing all of your senses to help you know where you are and where you want to go.
- Using your senses in combination with self-protective techniques and human guide techniques to move safely through indoor and outdoor environments.
- Using a cane and other devices to walk safely and efficiently.
- Soliciting and/or declining assistance.
- Finding destinations with strategies that include following directions and using landmarks and compass directions.

- Techniques for crossing streets, such as analysing and identifying intersections and traffic patterns.
- Problem-solving skills to determine what to do if you are disoriented or lost or need to change your route.
- Using public transportation and transit systems.

History of Orientation and Mobility

The profession of Orientation and Mobility began to develop during, and immediately after, World War II, when soldiers who had been blinded in battle were sent to recuperate at Valley Forge Army General Hospital before entering Avon Old Farms Convalescent Hospital, the U.S. Army's former experimental rehabilitation center for blind soldiers in Avon, Connecticut.

In order to better serve the large number of blind soldiers who required special training and services, the military recruited Richard E. Hoover, an army sergeant, who was assigned to the center for the treatment of blinded soldiers at Valley Forge Army Hospital in 1944. During the same year, Russell Williams, who was blinded by enemy action in France, received medical rehabilitation at the Valley Forge Army Hospital, and in 1947, C. Warren Bledsoe joined the Hospital. Both Hoover and Bledsoe had previously worked at the Maryland School for the Blind. These three men made significant contributions to the development of a new profession: Orientation and Mobility.

The blinded soldiers were highly motivated to be successful, and Richard Hoover believed that the traditional strategies taught and used to travel independently were inadequate. In response, he developed a technique for using a cane that is lightweight and longer than support canes. This technique and cane revolutionized independent travel for blind people and are still used today.

Orientation and mobility (O&M) training

Orientation and mobility (O&M) training is provided to people who are visually impaired to help them maintain travel independence. It teaches them new orientation and mobility skills to compensate for reduced visual information. Orientation and Mobility (O&M) teaches white cane techniques and orientation skills. This makes it possible for blind people to get about freely and independently without the assistance of sighted people. O&M training is the key for day-to-day wellbeing of blind people; and promotes social and economic integration. The benefits are not only practical but also emotional and psychological.

Activities of Daily Living (ADL) is part of orientation and mobility training. It teaches ways to carry out common daily tasks including cooking, using a telephone, using an auto bank, recognizing coins and banknotes, etc. Orientation and mobility training aims to facilitate independent functioning and participation in the community of people with low vision. (O&M) specialists teach individuals with visual impairments to travel safely, confidently and independently in their environment. They work with infants, children and adults usually on a one-to-one basis in a home, school, hospital or in the community.

11.9. VISUAL AND SPEECH PERCEPTUAL TRAINING

11.9.1. Visual Perceptual Training

Visual perception refers to the brain's ability to make sense of what the eyes see. This is not the same as visual acuity which refers to how clearly a person sees (for example "20/20 vision"). A person can have 20/20 vision and still have problems with visual perceptual processing. Good visual perceptual skills are important for many every day skills such as reading, writing, completing puzzles, cutting, drawing, completing math problems, dressing, finding your sock on the bedroom floor as well as many other skills. Without the ability to complete these everyday tasks, a child's self-esteem can suffer and their academic and play performance is compromised.

Visual perceptual skill is the ability that is necessary for our brain to make sense of what we see, and it is important for us to distinguish different words and word size in handwriting task. Visual perceptual training includes visual discrimination, spatial relationship, figure ground and form constancy ability etc., the training aim to improve children handwriting accuracy and legibility and spatial relationship.

11.9.2. Building Blocks Necessary to Develop Visual Perceptual Skill

- **Sensory Processing:** Accurate registration, interpretation and response to sensory stimulation in the environment and the child's own body.
- **Visual Attention:** The ability to focus on important visual information and filter out unimportant background information.
- **Visual Discrimination:** The ability to determine differences or similarities in objects based on size, colour, shape, etc.
- **Visual Memory:** The ability to recall visual traits of a form or object.
- **Visual Spatial Relation Ships:** Understanding the relationships of objects within the environment.
- **Visual Sequential-Memory:** The ability to recall a sequence of objects in the correct order.
- **Visual Figure Ground:** The ability to locate something in a busy background.
- **Visual Form Constancy:** The ability to know that a form or shape is the same, even if it has been made smaller/larger or has been turned around.
- **Visual Closure:** The ability to recognize a form or object when part of the picture is missing.

Visual perception activities can help a child to make sense of the information that the eyes are sending to the brain. Having good visual perception skills can therefore help prepare your child for formal learning.

11.9.3. Different Areas of Visual Perception

Form Constancy

This skill helps a child to realize that a letter remains the same no matter what font it is printed in, or whether it is written in a different place

(such as on a board instead of in a book). These form constancy activities and tips helps the child to learn how shapes and forms remain constant.

Visual Discrimination

Good visual discrimination can help a child to correctly perceive letters and numbers where there is only a small difference between them (eg. S and 5). Use of fun activities and games help child learn to pay attention to visual details in matching things up and spotting things that don't belong.

Figure-Ground Perception

Figure-ground perception, among other things, help a child to not lose his/her place when reading or when copying from the board. The figure-ground perception activities help the child learn to find information in a busy background, using activities, simple games and worksheet activities.

Visual Closure

Visual closure skills can help your child to make sense of things that are only partly visible. This can help the child to read more fluently and decode words more accurately.

Visual Memory and Visual Sequential Memory

Visual memory and visual sequential memory skills can play a vital role in reading and spelling.

Make use of readily available household materials and inexpensive games to improve visual memory and visual sequential memory.

Visual Motor Integration

Visual Motor Integration is a vital foundation for good handwriting skills.

The visual-motor integration activities help the child to get a head start before starting formal handwriting lessons.

Jigsaw Puzzles

Doing puzzles is a popular childhood activity. However, children from deprived backgrounds and children with developmental delays often struggle to grasp the concept of building puzzles.

Importance of Visual Perception Training

Therapeutic intervention to help a child with visual perception difficulties is important to:

- Improve ability in and persistence with visual tasks.
- Ensure the child is able to engage in/complete academic tasks.
- Help the child to complete self-care tasks, such as putting shoes on the right feet.
- Avoid the child becoming disengaged in an academic environment due to difficulties completing visual activities (e.g. writing, cutting and drawing).
- Avoid frustrations experienced by parents, teachers and children when a child is struggling to remain engaged in academic activities.
- Help maintain and develop a positive sense of well-being.
- Ensure that the child doesn't fall behind their peers in development of skills such as handwriting, spelling and maths.

Speech Perceptual Training

Speech sound perception training is used to help a child acquire a stable perceptual representation for the target phoneme or phonological structure.

Speech perception

1. Speech perception is the process by which the sounds of language are heard, interpreted and understood. ...
2. The process of perceiving speech begins at the level of the sound signal and the process of audition.
3. The speech sound signal contains a number of acoustic cues that are used in speech perception.

Speech Therapy Techniques

Techniques are recommended according to the unique needs of each patient. Therapy may include: Swallowing exercises – Swallowing and feeding therapy is designed to enhance oral-motor control. Speech therapists use various techniques to assist with swallowing, including facial massage and lip, tongue and jaw exercises. Techniques are recommended according to the unique needs of each patient. Therapy may include:

- ***Swallowing exercises*** – Swallowing and feeding therapy is designed to enhance oral-motor control. Speech therapists use various techniques to assist with swallowing, including facial massage and lip, tongue and jaw exercises. Therapy strengthens face and jaw muscles used for eating, drinking and swallowing, and increases perceptive abilities.
- ***Jaw, lip and tongue exercises*** – Muscle weakness and poor oral-motor coordination interferes with communication and feeding, posing socialization and nutrition issues for cerebral palsy patients. Assorted exercises strengthen lip, jaw and tongue muscles. Lollipops and tongue depressors are used to create resistance, developing strength and control. And eating extra-chewy foods may also be recommended, to build strength and train facial muscles.
- ***Articulation therapy*** – Demonstrating proper technique is a big part of this type of speech therapy. Through repetitive exercises, speech pathologists show how the mouth and tongue work together, producing sounds, syllables and words. Mirrors are often used to help a child learn facial control and visually illustrate progress.
- ***Blowing and breathing exercises*** – Blowing on whistles helps train mouth muscles to form shapes needed for producing particular sounds. Blowing activities also strengthen abdominal muscles and help CP patients control breathing.
- ***Language and word association*** – Speech therapists use pictures, books and objects to stimulate language development. While playing and talking with a child, for example, therapists' model correct language and association patterns, prompting the child to build vocabulary and grammar skills.
- **Using Flash Cards** – This fun and interactive game can help children and therapists focus on the sounds that they may have trouble with. Providing entertaining games helps keep patients involved and excited while learning.

- **Mirror Exercises** – This form of therapy helps children understand how movements of the mouth should be for certain sounding letters. This helps to improve this issue.

Check your Progress - 4

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

7. What is an orientation and mobility training?

....

....

8. State the importance of visual perceptual training.

....

....

11.10. ADAPTIVE MOBILITY DEVICES

Adaptive mobility devices (AMDs) are specially designed devices to provide environmental preview information to people who cannot use a long cane. AMDs are prescribed by orientation and mobility specialists (OMSs) to meet the unique needs of the child. Most adaptive mobility devices are built from PVC pipe to meet the specific needs of the child. The AMD is usually held by two hands and is pushed in front of the child's body.

AMD and long cane techniques are components of O&M for toddlers with visual impairments. Toddlers require many hands-on experiences to develop the cognitive, motor, social, and communicative skills necessary for safe and independent orientation and travel. Addressing all the O&M skills and concepts needed by toddlers with visual impairments goes beyond the scope of this handout. This handout focuses only on suggestions for teaching toddlers to use AMDs and canes. OMSs must use their professional knowledge and judgment to determine when to introduce AMDs and canes and how to incorporate their use into a comprehensive O&M program.

There are as many ways to teach AMD techniques to toddlers as there are toddlers with visual impairments. The suggestions given below are general guidelines that have been found to be effective with some children. It is necessary to modify these techniques and create new techniques to meet the unique needs of the children and families with whom we work.

Adaptive Mobility devices Training

First level. Some children respond well to an initial period of AMD use during unstructured, but mediated, exploration of a large, open area. A spacious area with occasional interesting landmarks to encounter can provide a sense of freedom of movement and safety to the child, while prompting increased pace with minimal frustration. Large areas that might be appropriate for exploration include the halls of a building, gym, large department store, or a mall. When the floor surfaces are smooth and carpet

NOTES

free, the AMD will slide more easily and the child will experience more success. The child will walk freely, while an adult mediates objects contacted by helping the child determine what the object is and how to maneuver around it.

Some children will benefit from more direct instruction in using the AMD. After the child has become familiar with the AMD, tell the child that he/she is going to walk with the AMD. Ask the child to stand up and position the AMD in front of the child. Tell the child to reach out and hold on to the AMD with two hands. Let the child practice holding on to the device and letting go several times. Some AMDs will stand unsupported but many will fall to the ground when not held. This experience gives the child a chance to learn more about the characteristics of AMD. Then suggest that you take a short walk (3-5 feet) to find a large object that is important to the child (e.g., the couch where Mama is sitting, the toy box). Be sure the path to the desired goal is clear of obstacles and drop-offs. As the child walks, you may need to provide verbal or physical reminders to keep both hands on the AMD. When the AMD contacts the object, praise the child, "You made it to your toy box!" Some children will be fascinated by the AMD and will want to continue exploring. Other children will want to put the AMD down and spend time in the location they worked so hard to reach.

Most children will need several simple lessons like the one described above to begin using the AMD. These lessons should involve a motivating goal to reach and a short, clear path to the goal. Some lessons may only last a few minutes due to the child's short attention span.

Advanced Level. Once the child is able to use an AMD to travel a cleared path, you can begin teaching the child more advanced skills such as obstacle detection, drop-off detection, and trailing. Most toddlers can learn to detect obstacles with their AMDs. Drop-off detection and trailing are much more complex skills and will be too difficult for many 2-year-olds. For toddlers who are ready to begin drop-off detection and trailing, remember that they will most likely only demonstrate beginning skills; do not expect mastery of these skills.

Obstacle detection can easily be taught in a naturalistic way. Place an object in the child's path that will sound or feel very different from the destination when hit by the AMD. For example, use a metal trashcan as an obstacle when the child is trying to reach an upholstered chair. When the AMD contacts the obstacle, say "Oh, my! There is a ________ in the way. Let's go around it." Some children will want to stop and explore what the AMD hit. This is perfectly acceptable and a wonderful opportunity for learning. Other children may need some physical or verbal guidance to go around the obstacle. Several structured lessons on obstacle detection using large, distinct obstacles can help a child learn to recognize and maneuver around obstacles. In most households and childcare settings, children will have plenty of naturally occurring opportunities to practice obstacle detection.

Drop-off detection is possible with some AMDs but not with all. The commonly used AMDs are NOT designed to be used when ascending or descending stairways. An example of a naturally occurring drop-off that would be appropriate for a child to find with an AMD would be a story area at the public library that is two or three steps lower than the rest of the floor, or one step that leads from the porch to the walkway at a child's home. If the

AMD is appropriate for detecting drop-offs, the OMS can plan lessons to teach the child about them. Start with the child several feet from the drop-off. Tell the child that she is going to use her AMD to find a drop-off. You may need to use the language the child already knows for drop-offs, such as *stair* or *curb,* or you may use this as an opportunity to teach *drop-off* as a new vocabulary word. Reassure the child that you will not let her fall. Explain that you and the child will walk toward the drop-off and that, when you get close, the AMD will "drop" in her hand. Walk with the child toward the drop-off and tell her just before the AMD reaches the drop-off. When the AMD "drops," say "Wow! Did you feel that? The AMD dropped." Let the child practice walking up to the drop-off several times until she is comfortable with the way the AMD feels at a drop-off. To understand what the drop-off is, the child may want to step down the drop-off while holding your hand or a railing. Children should also have opportunities to practice finding drop-offs in lots of different locations with different types of flooring.

Tell the child to be careful around drop-offs. Remind adults that they should always be within arm's reach of the child when she is near a drop-off.

Trailing with an AMD refers to keeping the AMD in contact with a wall while walking. Trailing allows the child to know her location in space and maintain a straight line of travel. Trailing will not be appropriate with all AMD devices. Trailing is best taught using a mini route to a meaningful location. Prior to the lesson, be sure the mini route is clear of obstacles. Tell the child that you are going to walk with the AMD to the motivating destination—for instance, a bookshelf. Ask the child to stand next to the wall and hold the AMD so the side is touching the wall. You may need to help the child position her body and the device appropriately. Walk with the child to the destination using verbal and physical prompts to keep the AMD against the wall as necessary. If the child knows how to trail with her hand, explain that she is now trailing with the AMD. Help the parents and childcare providers to identify short routes at home and in the child care setting in which trailing would be appropriate. Encourage parents and childcare providers to keep mini routes clear of obstacles and to have the child trail with the AMD during the daily routines.

11.11. REHABILITATION MEDICATIONS

Rehabilitation medicine is concerned with improving functioning through the diagnosis and treatment of health conditions, reducing impairments, and preventing or treating complications. Doctors with specific expertise in medical rehabilitation are referred to as physiatrists, rehabilitation doctors, or physical and rehabilitation specialists. Medical specialists such as psychiatrists, paediatricians, geriatricians, ophthalmologists, neurosurgeons, and orthopaedic surgeons can be involved in rehabilitation medicine, as can a broad range of therapists. In many parts of the world where specialists in rehabilitation medicine are not available, services may be provided by doctors and therapists. Rehabilitation medicine has shown positive outcomes, for example, in improving joint and limb function, pain management, wound healing, and psychosocial well-being.

Rehabilitation medicine uses many kinds of assistance, therapies, and devices to improve function. The type of rehabilitation a person receives depends on the condition causing impairment, the bodily function that is affected, and the severity of the impairment.

11.12. LET US SUM UP

Rehabilitation is defined as "a set of measures that assist individuals who experience, or are likely to experience, disability to achieve and maintain optimal functioning in interaction with their environments" Rehabilitation targets improvements in individual functioning – say, by improving a person's ability to eat and drink independently.

Rehabilitation also includes making changes to the individual's environment – for example, by installing a toilet handrail. But barrier removal initiatives at societal level, such as fitting a ramp to a public building, are not considered rehabilitation. Rehabilitation involves identification of a person's problems and needs, relating the problems to relevant factors of the person and the environment, defining rehabilitation goals, planning and implementing the measures, and assessing the effects (see figure below). Educating people with disabilities is essential for developing knowledge and skills for self-help, care, management, and decision-making. People with disabilities and their families experience better health and functioning when they are partners in rehabilitation.

11.13. UNIT – END EXERCISES

1. Define rehabilitation.
2. Analyse neuro developmental therapy in the present context.
3. Enumerate the benefits of physical therapy.
4. Differentiate occupational therapy and physical therapy.
5. Explain the strategies of speech therapy.
6. Why parental involvement is considered essential for getting better results in speech therapy for children?
7. What is the role of orientation and mobility training for visually impaired?
8. What are the different areas of visual perception? State the importance of training them.
9. Discuss the different speech therapy techniques.
10. What are adaptive mobility devices and how shall the training be given with adaptive mobility devices.

11.14. ANSWERS TO CHECK YOUR PROGRESS

1. Rehabilitation is the process of removing, or reducing as far as possible, the factors that limit the activity and participation of a person with disability, so that he/she can attain and maintain the highest possible level of independence and quality of life: physically, mentally, socially and vocationally.
2. The various therapeutic rehabilitation services include neuro developmental therapy, Physical therapy, occupational therapy,

speech therapy, O & M training, visual and speech perceptual training etc.

3. The occupational therapy focuses on restoring an individual's ability to perform necessary daily activities. This may mean working to improve fine motor skills, restore balance, or assist patients in learning how to increase their functional ability via use of adaptive equipment, among other potential treatment options.
4. An individual having an injury or illness that results in pain, physical impairment, or limited normal movement/loss of function, can seek the help of a physical therapist.
5. The most common speech disorders include articulation disorders, fluency disorders, resonance or voice disorders, receptive disorders, expressive disorders, cognitive-communication disorders.
6. Stuttering is a problem that usually develops during childhood but can develop during adulthood as well. Stuttering is usually considered a type of behavioural problem. Speech therapists will try to teach the child who stutters, through behavioural modification techniques that in turn may help control their stuttering. A common method that may be used is to teach them to control the rate of speech since speaking too quickly can make stuttering worse for some people. Practicing speech in a slower, more fluent manner can be helpful. It can also be helpful to monitor breathing. Even after treatment, people who stutter may require follow-up sessions with their speech therapist to keep the problem from recurring.
7. An Orientation and Mobility (O&M) training provides instruction that can help you develop or re-learn the skills and concepts you need to travel safely and independently within your home and in the community.
8. Visual perceptual skill is the ability that is necessary for our brain to make sense of what we see, and it is important for us to distinguish different words and word size in handwriting task. Visual perceptual training includes visual discrimination, spatial relationship, figure ground and form constancy ability etc., the training aim to improve children handwriting accuracy and legibility and spatial relationship.

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BLOCK–IV: DISABILITY AND REHABILITATION

UNIT XII - REHABILITATION AIDS AND TOOLS

STRUCTURE

12.1. INTRODUCTION

Rehabilitation can be of significant benefit to an individual who is experiencing a change in his or her physical abilities. Most people are familiar with the importance of rehabilitation following surgery, injury, or stroke. Rehabilitation addresses many of the issues and challenges experienced by individuals with Multiple Sclerosis. Some of the specific symptoms that may be helped include spasticity, weakness, and resultant movement problems; balance, dizziness, and coordination difficulties; as well as changes in speech, swallowing, cognition, and vision. Treating these specific symptoms, however, is only the beginning. Limitations in movement and other abilities affect many other aspects of everyday life, and the different types of therapy offered through rehabilitation work to regain, or find ways to compensate for, lost function. Safety precautions and the prevention of pressure sores are also vital issues that are promoted through rehabilitation. This unit deals with some of the rehabilitation aids that are predominantly applied/utilized for disabled persons.

12.2. OBJECTIVES

After reading this unit, the readers shall be able to

- Acquire knowledge about rehabilitation aids and tools.
- Understand the concept of prosthetics and orthotics in rehabilitation.

- Guide the individuals to approach suitable therapeutic rehabilitation services.
- Comprehend the essentials in training general and instructional activities of daily living.
- Figure out the self-help devices and environmental control units needed for rehabilitation.

12.3. REHABILITATION AIDS AND TOOLS

The unique and wonderful concept behind rehabilitation is that it incorporates an individual's entire situation, taking into account how physical changes may impact one's activities, emotions, and well-being. With rehabilitation, a team of specialists work together to address all aspects of an individual's disability. Their overall goal is to improve a person's quality of life, while helping to preserve one's independence and safety. Rehabilitation is also extremely beneficial to individuals who are not having a flare-up but who are experiencing symptoms. Physical therapy, occupational therapy, speech therapy, and recreational therapy can all help to relieve certain symptoms, increase function, and provide an emotional boost for the clients.

Rehabilitation is often prescribed after an exacerbation subsides. This may help regain lost function as well as gradually return someone to his or her previous level of activity. Physical therapy may be the first thing that comes to mind when thinking of rehabilitation. The physical therapist (PT) is primarily involved with posture, movement, and the lower extremities, giving special attention to safety and energy conservation. Many tools are used to help reduce problems associated with dizziness, balance, and coordination. In general, the therapist must work gradually with the client, starting from a low center of gravity and moving up a high center of gravity. The same is true for a support base, progressing from wide to narrow.

Rehabilitation aids and tools cover a wide range of supportive devices that include General aids, fracture aids & Utility splints, Physiotherapy products, Exercise equipment, Pressure garments, Compression clothing, Traction kits, Walking aids, Abdominal splints, Arm, wrist, Elbow & finger splints, Back & Posture splints, Cervical splints, Knee and ankle splints, Shoulder rib & Clavicle splints.

12.4. PROSTHETICS AND ORTHOTICS

Prosthetics and Orthotics is a dynamic and expanding allied health science profession. Technically, Prosthetics and Orthotics are separate disciplines, but their common goals in rehabilitation unite them into one cooperative entity.

Prosthetics involves the use of artificial limbs (prostheses) to enhance the function and lifestyle of persons with limb loss. The prosthesis must be a unique combination of appropriate materials, alignment, design, and construction to match the functional needs of the individual. These needs are complex and vary for upper and lower extremities. Lower limb prostheses might address stability in standing and walking, shock absorption, energy storage and return, cosmetic appearance, and even extraordinary functional needs associated with running, jumping, and other

athletic activities. Upper limb prostheses might address reaching and grasping, specific occupational challenges such as hammering, painting, or weight lifting, and activities of daily living such as eating, writing, and dressing.

Orthotics involves precision and creativity in the design and fabrication of external braces (orthoses) as part of a patient's treatment process. The orthosis acts to control weakened or deformed regions of the body of a physically challenged person. Orthoses may be used on various areas of the body including the upper and lower limbs, cranium, or spine. Common orthotic interventions include spinal orthoses for scoliosis, HALOs used in life-threatening neck injuries, and ankle foot orthoses used in the rehabilitation of children with cerebral palsy. More recently, orthoses have been designed to dramatically realign the bones of the skull in infants with positional plagiocephaly.

Difference between Prosthetics and Orthotics

The major **difference between orthotics** and **prosthetics** is that while an **orthotic** device is used to enhance a person's limb, a **prosthetic** device is used to replace a limb entirely.

12.4.1. Orthotics

Orthotics (*ortho*, means to straighten, to align) is a medical specialty that focuses on the design and application of **orthoses**. An *orthosis* (plural: *orthoses*) is "an externally applied device used to modify the structural and functional characteristics of the neuromuscular and skeletal system". An **orthotist** is the primary medical clinician responsible for the prescription, manufacture and management of orthoses. An orthosis may be used to:

- Control, guide, limit and/or immobilize an extremity, joint or body segment for a particular reason
- Restrict movement in a given direction
- Assist movement generally
- Reduce weight bearing forces for a particular purpose
- Aid rehabilitation from fractures after the removal of a cast
- Otherwise correct the shape and/or function of the body, to provide easier movement capability or reduce pain

Orthotics combines knowledge of anatomy and physiology, pathophysiology, biomechanics and engineering. Patients who benefit from an orthosis may have a condition such as spina bifida or cerebral palsy, or have experienced a spinal cord injury or stroke. Equally, orthoses are sometimes used prophylactically or to optimize performance in sport.

Orthoses were traditionally made by following a tracing of the extremity with measurements to assist in creating a well-fitted device. Subsequently, the advent of plastics as a material of choice for construction necessitated the idea of creating a plaster of Paris mould of the body part in question. This method is still extensively used throughout the industry. Currently, CAD/CAM, CNC machines and 3D printing are involved in orthotic manufacture.

Orthoses are made from various types of materials including thermoplastics, carbon fibre, metals, elastic, EVA, fabric or a combination of similar materials. Some designs may be purchased at a local retailer; others are more specific and require a prescription from a physician, who will fit the orthosis according to the patient's requirements. Over the counter braces are basic and available in multiple sizes. They are generally slide on or strapped on with Velcro, and are held tightly in place. One of the purposes of these braces is injury protection.

Classification

Under the International Standard terminology, orthoses are classified by an acronym describing the anatomical joints which they contain. For example, an ankle foot orthosis ('AFO') is applied to the foot and ankle, a thoracolumbosacral orthosis ('TLSO') affects the thoracic, lumbar and sacral regions of the spine. It is also useful to describe the function of the orthosis. Use of the International Standard is promoted to reduce the widespread variation in description of orthoses, which is often a barrier to interpretation of research studies.

Upper-Limb Orthoses

Upper-limb (or upper extremity) orthoses are mechanical or electromechanical devices applied externally to the arm or segments thereof in order to restore or improve function, or structural characteristics of the arm segments encumbered by the device. In general, musculoskeletal problems that may be alleviated by the use of upper limb orthoses include those resulting from trauma or disease (arthritis for example). They may also be beneficial in aiding individuals who have suffered a neurological impairment such as stroke, spinal cord injury, or peripheral neuropathy.

Lower-limb orthoses

A lower-limb orthosis is an external device applied to a lower-body segment to improve function by controlling motion, providing support through stabilizing gait, reducing pain through transferring load to another area, correcting flexible deformities, and preventing progression of fixed deformities.

Foot orthoses

Foot orthoses (commonly called "orthotics") are devices inserted into shoes to provide support for the foot by redistributing ground reaction forces acting on the foot joints while standing, walking or running. They may be either pre-moulded (also called pre-fabricated) or custom made according to a cast or impression of the foot. They are used by everyone from athletes to the elderly to accommodate biomechanical deformities and a variety of soft tissue conditions. Custom-made foot orthoses are effective at reducing pain for people with painful high-arched feet, and may be effective for people with rheumatoid arthritis. Foot orthoses may also be

used in conjunction with properly fitted orthopaedic footwear in the prevention of foot ulcers in the at-risk diabetic foot.

Ankle–foot orthosis

An ankle–foot orthosis (AFO) is an orthosis or brace that encumbers the ankle and foot. AFOs are externally applied and intended to control position and motion of the ankle, compensate for weakness, or correct deformities. AFOs can be used to support weak limbs, or to position a limb with contracted muscles into a more normal position. They are also used to immobilize the ankle and lower leg in the presence of arthritis or fracture, and to correct foot drop; an AFO is also known as a foot-drop brace.

Ulcer healing orthosis (UHO)

A custom-made ankle/foot orthosis for the treatment of patients having plantar ulcers is disclosed, which comprises a rigid L-shaped support member and a rigid anterior support shell hingedly articulated to the L-shaped support member. The plantar portion of the L-shaped member further comprises at least one ulcer-protecting hollow spatially located for fitted placement in inferior adjacency to a user's plantar ulcer, thus allowing the user to transfer the user's weight away from the plantar ulcer and facilitating plantar ulcer treatment.

Knee-ankle-foot orthosis (KAFOs)

A knee-ankle-foot orthosis (KAFO) is an orthosis that encumbers the knee, ankle and foot. Motion at all three of these lower limb areas is affected by a KAFO and can include stopping motion, limiting motion, or assisting motion in any or all of the three planes of motion in a human joint: sagittal, coronal, and axial.

Mechanical hinges, as well as electrically controlled hinges have been used. Various materials for fabrication of a KAFO include but are not limited to metals, plastics, fabrics, and leather. Conditions that might benefit from the use of a KAFO include paralysis, joint laxity or arthritis, fracture, and others.

Knee orthosis (KO)

A knee orthosis (KO) or knee brace is a brace that extends above and below the knee joint and is generally worn to support or align the knee. In the case of diseases causing neurological or muscular impairment of muscles surrounding the knee, a KO can prevent flexion or extension instability of the knee. In the case of conditions affecting the ligaments or cartilage of the knee, a KO can provide stabilization to the knee by replacing the function of these injured or damaged parts.

Prophylactic, functional and rehabilitation braces

Prophylactic braces are used primarily by athletes participating in contact sports. Evidence about prophylactic knee braces, the ones football linemen wear that are often rigid with a knee hinge, indicates they are ineffective in reducing anterior cruciate ligament tears, but may be helpful in resisting medial and lateral collateral ligament tears.

Functional braces are designed for use by people who have already experienced a knee injury and need support to recover from it. They are also indicated to help people who are suffering from pain associated with arthritis. They are intended to reduce the rotation of the knee and support stability. They reduce the chance of hyperextension, and increase the agility and strength of the knee. The majority of these are made of elastic. They are the least expensive of all braces and are easily found in a variety of sizes.

Rehabilitation braces are used to limit the movement of the knee in both medial and lateral directions- these braces often have an adjustable range of motion stop potential for limiting flexion and extension following ACL reconstruction. They are primarily used after injury or surgery to immobilize the leg. They are larger in size than other braces, due to their function.

Orthotists

Orthotists are healthcare professionals who specialize in the provision of orthoses.

12.4.2. Prosthetics

In medicine, a **prosthesis** or **prosthetic implant** is an artificial device that replaces a missing body part, which may be lost through trauma, disease, or a condition present at birth (congenital disorder).

Prostheses are intended to restore the normal functions of the missing body part. Amputee rehabilitation is primarily coordinated by a physiatrist as part of an inter-disciplinary team consisting of physiatrists, prosthetists, nurses, physical therapists, and occupational therapists.

Prostheses can be created by hand or with Computer-Aided Design (CAD), a software interface that helps creators design and analyse the creation with computer-generated 2-D and 3-D graphics as well as analysis and optimization tools.

Types

A person's prosthesis should be designed and assembled according to the person's appearance and functional needs. For instance, a person may need a transradial prosthesis, but need to choose between an aesthetic functional device, a myoelectric device, a body-powered device, or an activity specific device. The person's future goals and economical capabilities may help them choose between one or more devices.

Craniofacial prostheses include intra-oral and extra-oral prostheses. Extra-oral prostheses are further divided into hemifacial, auricular (ear), nasal, orbital, and ocular. Intra-oral prostheses include dental prostheses such as dentures, obturators and dental implants.

Prostheses of the neck include larynx substitutes, trachea and upper esophageal replacements, Somato prostheses of the torso include breast prostheses which may be either single or bilateral, full breast devices or nipple prostheses. Penile prostheses are used to treat erectile dysfunction.

Limb prostheses

Upper-extremity prostheses are used at varying levels of amputation: forequarter, shoulder disarticulation, transhumeral prosthesis,

elbow disarticulation, transradial prosthesis, wrist disarticulation, full hand, partial hand, finger, partial finger. Transradial prosthesis is an artificial limb that replaces an arm missing below the elbow.

Upper limb prostheses can be categorized in three main categories: Passive devices, Body Powered devices, Externally Powered (myoelectric) devices. Passive devices can either be passive hands, mainly used for cosmetic purpose, or passive tools, mainly used for specific activities (e.g. leisure or vocational). Body Powered or cable operated limbs work by attaching a harness and cable around the opposite shoulder of the damaged arm. The third categories of prosthetic devices available are myoelectric arms. These works by sensing, via electrodes, when the muscles in the upper arm move, causing an artificial hand to open or close.

Lower-extremity prostheses provide replacements at varying levels of amputation. These include hip disarticulation, transfemoral prosthesis, knee disarticulation, transtibial prosthesis, Syme's amputation, foot, partial foot, and toe. The two main subcategories of lower extremity prosthetic devices are trans-tibial (any amputation transecting the tibia bone or a congenital anomaly resulting in a tibial deficiency) and trans-femoral (any amputation transecting the femur bone or a congenital anomaly resulting in a femoral deficiency).

Transfemoral prosthesis is an artificial limb that replaces a leg missing above the knee. Transfemoral amputees can have a very difficult time regaining normal movement. In general, a transfemoral amputee must use approximately 80% more energy to walk than a person with two whole legs. This is due to the complexities in movement associated with the knee.

Transtibial prosthesis is an artificial limb that replaces a leg missing below the knee. A transtibial amputee is usually able to regain normal movement more readily than someone with a transfemoral amputation, due in large part to retaining the knee, which allows for easier movement.

Physical therapists are trained to teach a person to walk with leg prosthesis. To do so, the physical therapist may provide verbal instructions and may also help guide the person using touch or tactile cues. This may be done in a clinic or home. There is some research suggesting that such training in the home may be more successful if the treatment includes the use of a treadmill. Using a treadmill, along with the physical therapy treatment, helps the person to experience many of the challenges of walking with prosthesis.

Myoelectric Prosthesis

A **myoelectric prosthesis** uses the electrical tension generated every time a muscle contracts, as information. This tension can be captured from voluntarily contracted muscles by electrodes applied on the skin to control the movements of the prosthesis, such as elbow flexion/extension, wrist supination/pronation (rotation) or opening/closing of the fingers. Prosthesis of this type utilizes the residual neuromuscular system of the human body to control the functions of an electric powered prosthetic hand, wrist, elbow or foot. This is different from an electric switch prosthesis, which requires straps and/or cables actuated by body movements to actuate or operate

switches that control the movements of the prosthesis. There is no clear evidence concluding that myoelectric upper extremity prostheses function better than body-powered prostheses. Advantages to using a myoelectric upper extremity prosthesis include the potential for improvement in cosmetic appeal (this type of prosthesis may have a more natural look), may be better for light everyday activities, and may be beneficial for people experiencing phantom limb pain. When compared to a body-powered prosthesis, a myoelectric prosthesis may not be as durable, may have a longer training time, may require more adjustments, may need more maintenance, and does not provide feedback to the user.

Robotic prostheses

Robots can be used to generate objective measures of patient's impairment and therapy outcome, assist in diagnosis, customize therapies based on patient's motor abilities, and assure compliance with treatment regimens and maintain patient's records. It is shown in many studies that there is a significant improvement in upper limb motor function after stroke using robotics for upper limb rehabilitation.

In order for a robotic prosthetic limb to work, it must have several components to integrate it into the body's function: Biosensors detect signals from the user's nervous or muscular systems. It then relays this information to a controller located inside the device, and processes feedback from the limb and actuator, e.g., position or force, and sends it to the controller. Examples include surface electrodes that detect electrical activity on the skin, needle electrodes implanted in muscle, or solid-state electrode arrays with nerves growing through them. One type of these biosensors is employed in myoelectric prostheses.

A device known as the controller is connected to the user's nerve and muscular systems and the device itself. It sends intention commands from the user to the actuators of the device and interprets feedback from the mechanical and biosensors to the user. The controller is also responsible for the monitoring and control of the movements of the device.

An actuator mimics the actions of a muscle in producing force and movement. Examples include a motor that aids or replaces original muscle tissue.

Targeted muscle reinnervation (TMR) is a technique in which motor nerves, which previously controlled muscles on an amputated limb, are surgically rerouted such that they reinnervate a small region of a large, intact muscle, such as the pectoralis major. As a result, when a patient thinks about moving the thumb of his missing hand, a small area of muscle on his chest will contract instead. By placing sensors over the reinnervated muscle, these contractions can be made to control the movement of an appropriate part of the robotic prosthesis.

A variant of this technique is called targeted sensory reinnervation (TSR). This procedure is similar to TMR, except that sensory nerves are surgically rerouted to skin on the chest, rather than motor nerves rerouted to muscle. Recently, robotic limbs have improved in their ability to take signals from the human brain and translate those signals into motion in the artificial limb. DARPA, the Pentagon's research division, is working to make even more advancements in this area. Their desire is to create an artificial limb that ties directly into the nervous system.

Robotic arms

Advancements in the processors used in myoelectric arms have allowed developers to make gains in fine-tuned control of the prosthetic. The Boston Digital Arm is a recent artificial limb that has taken advantage of these more advanced processors. The arm allows movement in five axes and allows the arm to be programmed for a more customized feel. Recently the I-LIMB Hand, invented in Edinburgh, Scotland, by David Gow has become the first commercially available hand prosthesis with five individually powered digits. The hand also possesses a manually rotatable thumb which is operated passively by the user and allows the hand to grip in precision, power, and key grip modes.

An approach that is very useful is called arm rotation which is common for unilateral amputees which is an amputation that affects only one side of the body; and also essential for bilateral amputees, a person who is missing or has had amputated either both arms or legs, to carry out activities of daily living. This involves inserting a small permanent magnet into the distal end of the residual bone of subjects with upper limb amputations. When a subject rotates the residual arm, the magnet will rotate with the residual bone, causing a change in magnetic field distribution. EEG (electroencephalogram) signals, detected using small flat metal discs attached to the scalp, essentially decoding human brain activity used for physical movement, is used to control the robotic limbs. This allows the user to control the part directly.

Robotic legs

The research of Robotic legs has made some advancement over time, allowing exact movement and control. A company in Switzerland called Ossur, has created a robotic leg that moves through algorithms and sensors that automatically adjust the angle of the foot during different points in its wearer's stride. Also, there are brain-controlled bionic legs that allow an individual to move his limbs with a wireless transmitter.

Prosthesis design

The main goal of a robotic prosthesis is to provide active actuation during gait to improve the biomechanics of gait, including, among other things, stability, symmetry, or energy expenditure for amputees. There are several powered prosthetic legs currently on the market, including fully powered legs, in which actuators directly drive the joints, and semi-active legs, which use small amounts of energy and a small actuator to change the mechanical properties of the leg but do not inject net positive energy into gait.

Attachment to the body

Most prostheses can be attached to the exterior of the body, in a non-permanent way. Some others however can be attached in a permanent way. One such example is exoprostheses

Direct bone attachment and Osseo integration

Osseo integration is a method of attaching the artificial limb to the body. This method is also sometimes referred to as exoprosthesis (attaching an artificial limb to the bone), or endo-exoprosthesis.

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The stump and socket method can cause significant pain in the amputee, which is why the direct bone attachment has been explored extensively. The method works by inserting a titanium bolt into the bone at the end of the stump. After several months the bone attaches itself to the titanium bolt and an abutment is attached to the titanium bolt. The abutment extends out of the stump and the (removable) artificial limb is then attached to the abutment. Some of the benefits of this method include the following:

- Better muscle control of the prosthetic.
- The ability to wear the prosthetic for an extended period of time; with the stump and socket method this is not possible.
- The ability for transfemoral amputees to drive a car.

The main disadvantage of this method is that amputees with the direct bone attachment cannot have large impacts on the limb, such as those experienced during jogging, because of the potential for the bone to break.

Cosmesis

Cosmetic prosthesis has long been used to disguise injuries and disfigurements. With advances in modern technology, cosmesis, the creation of lifelike limbs made from silicone or PVC has been made possible. Such prosthetics, including artificial hands, can now be designed to simulate the appearance of real hands, complete with freckles, veins, hair, fingerprints and even tattoos. Custom-made cosmeses are generally more expensive (costing thousands of U.S. dollars, depending on the level of detail), while standard cosmeses come premade in a variety of sizes, although they are often not as realistic as their custom-made counterparts. Another option is the custom-made silicone cover, which can be made to match a person's skin tone but not details such as freckles or wrinkles. Cosmeses are attached to the body in any number of ways, using an adhesive, suction, form-fitting, stretchable skin, or a skin sleeve.

Cognition

Unlike neuromotor prostheses, neurocognitive prostheses would sense or modulate neural function in order to physically reconstitute or augment cognitive processes such as executive function, attention, language, and memory. No neurocognitive prostheses are currently available but the development of implantable neurocognitive brain-computer interfaces has been proposed to help treat conditions such as stroke, traumatic brain injury, cerebral palsy, autism, and Alzheimer's disease. The recent field of Assistive Technology for Cognition concerns the development of technologies to augment human cognition. Scheduling devices such as Neuropage remind users with memory impairments when to perform certain activities, such as visiting the doctor. Micro-prompting devices such as PEAT, Able Link and Guide have been used to aid users with memory and executive function problems to perform activities of daily living.

12.4.3. What Prosthetists & Orthotists Do?

The **prosthetist's** work usually begins with an examination of the patient. The prosthetist assesses the patient's history, tests muscle strength

and range of motion, and evaluates joint motion. With the use of special tools, these clinical professionals measure the residual limb (stump) as one of the first step in the design of prosthesis. The prosthesis is created to match the unique needs of a person with limb loss. The prosthetist combines knowledge of medicine, engineering, and materials science in matching technology to enhance the lives of persons with limb loss, with particular attention to comfort, stability, and proper fit.

Similar to the scope of practice of a prosthetist, **orthotists** also work with physicians and other health care professionals in a clinical setting to rehabilitate the physically challenged, with a common goal of enabling individuals to function to the best of their ability. Orthotists are also employed in industry as designers, manufacturers or component suppliers, or may be involved in academia as teachers or researchers.

Check your Progress - 1

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

1. What do you mean by Orthotics?

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2. What do you understand by the term Prosthetics?

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12.5. OCCUPATIONAL THERAPY

The occupational therapist (OT) is concerned with how individuals occupy their time and how they function in their ADL (activities of daily living). The OT mostly works with upper extremities, fine-motor skills, and eye-hand coordination. For developing strength, several types of hand-strengthening devices are available for grasping and squeezing. Putty is used for rolling, gripping, and to practice cutting. A variety of peg boards, in different sizes and levels of complexity, help individuals to regain coordination. The OT can create finger and hand support if needed for writing (due to weakness or tremor), or a splint to support a contracture. An OT also makes arm braces for those requiring added support. Other devices are available to assist with using a computer keyboard.

The occupational therapy area of a rehabilitation facility is particularly interesting. It may include working kitchens, laundry rooms, and bathrooms – just like someone's home – to learn and practice techniques for accomplishing everyday tasks. The therapist works with individuals to practice regular household activities such as washing dishes; washing, drying, and folding laundry; and preparing a meal. Additionally, bathrooms

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are set up with special toilet seats, grab rails, tub seats, and roll-in showers to help individuals learn how to transfer from one seat to another.

Throughout the different areas, an OT will teach individuals techniques that will help conserve energy and promote safety. Assistive devices are often used as well, and these include long-handled sponges for washing; dressing aids that can help with buttons, zippers, socks, and shoes; and specially designed plates, cups, and utensils.

The OT may also be involved with workplace intervention. This can include visiting a person's office or work environment to evaluate safety, comfort, and efficiency. An OT will make recommendations for improving these issues, such as rearranging furniture, relocating someone's office closer to the exit and restrooms, and adding various types of adaptive equipment. Other suggestions may be made to help with symptoms of Multiple Sclerosis, and these may include a flexible work schedule, a longer lunch break to allow for rest, and making sure the office is kept at a comfortable temperature.

An occupational therapist will evaluate an individual with Multiple Sclerosis for range of motion, strength, sensation, and tone of the upper extremities. The occupational therapist will also evaluate functional activities such as feeding, dressing, bathing, and other activities of daily living. A detailed discussion on Occupational Therapy is given in the previous chapter.

12.6. ACTIVITIES OF DAILY LIVING FOR REHABILITATION

Activities of Daily Living (ADL)

Activities of Daily Living are all those tasks of everyday life which have a specific value and meaning to individuals, as well as purpose. Occupations are central to a person's identity and competence, and they influence how one spends time and makes decisions.

How are Activities of Daily Living Classified?

Activities of Daily Living are classified into the following categories

- Basic Activities of Daily Living
- Instrumental Activities of Daily Living

Basic Activities of Daily Living (ADL)

Basic Activities of Daily Living are activities oriented toward taking care of one's own body. Basic activities of daily living include:

- ✓ Bathing / showering
- ✓ Bowel and bladder management
- ✓ Dressing
- ✓ Eating
- ✓ Feeding
- ✓ Functional mobility
- ✓ Personal device care
- ✓ Personal hygiene and grooming
- ✓ Sexual activity
- ✓ Sleep / rest
- ✓ Toilet hygiene

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Instrumental Activities of Daily Living (IADL)

Instrumental Activities of Daily Living are activities oriented toward interacting with the environment; they are often complex, and they are generally optional in nature since they may be delegated to another. Instrumental activities of daily living include:

- Care of others (including selecting and supervising caregivers)
- Care of pets
- Child rearing
- Communication device use
- Community mobility
- Financial management
- Health management and maintenance
- Home establishment and management
- Meal preparation and clean-up
- Safety procedures and emergency responses
- Shopping

12.6.1. Training in Activities of Daily Living

Activities associated with organized patterns of behaviour that are characteristic and expected of an individual or an individual interacting with others within a given social system.

- Community
- Family
- Peers / friends

Exercises for improving activities of daily living in adults

Getting Dressed

This first exercise is a good example to work basic activities of daily living, and is ideal for working with Alzheimer's patients. This task involves dressing a doll figure appropriately, by taking into account both the part of the body where each item goes and dressing in a sequential fashion, as well as selecting clothing appropriate to occasion. This activity focuses on procedural memory, body schema, ideational praxis, semantic memory, and planning..

Exercises for improving activities of daily living in children and teenagers

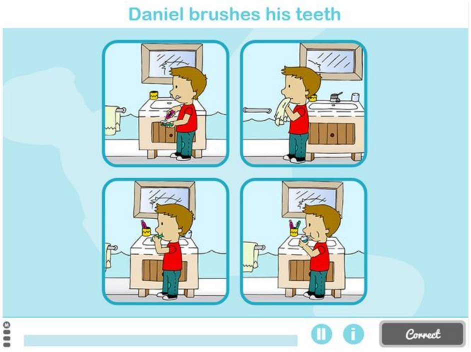
Pack your Pack back

The first activity of daily living for children and teenagers is *Pack your Pack back.* This task involves packing the pack back for school by selecting only the objects necessary for that day of school. The aim of the game is that the children don´t forget anything behind, but also, they don't have to pack things that they won´t need or the backpack will be too heavy for them to carry! A great challenge!

This game to improve planning and selective attention is ideal for children with ADHD. These children tend to inattention and put things in their backpack without thinking if they are useful or not and forgetting half of books at home. This game will teach them how to pack their backpack.

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Step by Step (Picture-Only)



This planning and reasoning activity consist on putting in logical order the different steps necessary to complete an activity (visual content).

Step by Step (Text-Only)



This activity of daily living is similar to the previous one, but in this case, we work with written content instead of drawings. In addition, this exercise also works the comprehension.

12.6.2. Instrumental Activities of Daily Living

Instrumental Activities of Daily Living are activities oriented toward interacting with the environment; they are often complex, and they are generally optional in nature since they may be delegated to another. Instrumental activities of daily living include:

- Care of others (including selecting and supervising caregivers)
- Care of pets
- Child rearing
- Communication device use
- Community mobility
- Financial management
- Health management and maintenance
- Home establishment and management
- Meal preparation and clean-up
- Safety procedures and emergency responses
- Shopping

ATM Withdrawal

This exercise is a simulation of an instrumental activity of daily living. Clients easily work on how to withdraw money from an ATM so that in the future, they can perform again this task with a real ATM. This activity targets planning in particular.

Recycling

This activity of daily living involves putting different types of waste in the proper bin or container.

- Yellow bin: containers (cans and plastic)
- Blue bin: paper and cardboard
- Green bin: glass
- Dark green/red bin: organic waste

This activity trains memory and reasoning.

Meal Preparation and Clean up

A simulator is used to learn how to use an electronic/induction stove to heat different foods on display while selecting the different programs accordingly. This exercise for improving instrumental activities of daily living aims to enhance executive functions.

Accurate Payments

Accurate Payments is an activity of daily living which consists on selecting the amount of money request. It is a very exercise for people with Alzheimer's disease. We will be working on working memory, purchasing and planning.

12.7. SELF-HELP DEVICES

It covers a wide range of devices, including a special cuff to aid in holding a hair brush, one-handed fingernail clipper and file, toothbrush holder, work table and book rest for use by the supine patient, and many other aids to the handicapped. These devices are products and tools that can make life easier. They might be new things you add to your home or improvements to something you already have. These simple devices let you continue to do your everyday activities, and move around with more ease.

The first step is to recognize when and where you could use some more help. Sometimes people adapt to changes in their ability level, giving up things they like to do without even realizing it. Next, take action to stay as independent as possible.

Self-help devices are also called assistive devices. Assistive devices and technologies are those whose primary purpose is to maintain or improve an individual's functioning and independence to facilitate participation and to enhance overall well-being. Examples of assistive devices and technologies include wheelchairs, prostheses, hearings aids, visual aids, and specialized computer software and hardware that increase mobility, hearing, vision, or communication capacities.

The International Classification of Functioning, Disability and Health (ICF) defines assistive products and technology as any product, instrument, equipment or technology adapted or specially designed for improving the functioning of a person with a disability.

The International Organization for Standardization (ISO) defines assistive products more broadly as any product, especially produced or generally available, that is used by or for persons with disability: for participation; to protect, support, train, measure or substitute for body functions/structures and activities; or to prevent impairments, activity limitations or participation restrictions.

Assistive devices can incur significant purchase and maintenance costs, especially for children and those undergoing rehabilitation with expected improvement whose growth or changing abilities mean they will outgrow their assistive devices.

Some examples of assistive devices are:

- Mobility aids, such as wheelchairs, scooters, walkers, canes, crutches, prosthetic devices, and orthotic devices.
- Hearing aids to help people hear or hear more clearly.
- Cognitive aids, including computer or electrical assistive devices, to help people with memory, attention, or other challenges in their thinking skills.
- Computer software and hardware, such as voice recognition programs, screen readers, and screen enlargement applications, to help people with mobility and sensory impairments use computers and mobile devices.
- Tools such as automatic page turners, book holders, and adapted pencil grips to help learners with disabilities participate in educational activities
- Closed captioning to allow people with hearing problems to watch movies, television programs, and other digital media.
- Physical modifications in the built environment, including ramps, grab bars, and wider doorways to enable access to buildings, businesses, and workplaces.
- Lightweight, high-performance mobility devices that enable persons with disabilities to play sports and be physically active.
- Adaptive switches and utensils to allow those with limited motor skills to eat, play games, and accomplish other activities.
- Devices and features of devices to help perform tasks such as cooking, dressing, and grooming; specialized handles and grips, devices that extend reach, and lights on telephones and doorbells are a few examples.

What conditions may benefit from assistive devices?

Some disabilities are quite visible, while others are "hidden." Most disabilities can be grouped into the following categories:

- Cognitive disability: intellectual and learning disabilities/disorders, distractibility, reading disorders, inability to remember or focus on large amounts of information
- Hearing disability: hearing loss or impaired hearing
- Physical disability: paralysis, difficulties with walking or other movement, inability to use a computer mouse, slow response time, difficulty controlling movement
- Visual disability: blindness, low vision, colour blindness
- Mental conditions: post-traumatic stress disorder, anxiety disorders, mood disorders, eating disorders, psychosis

Many people with hidden disabilities can benefit from assistive technologies for certain activities or during certain stages of their diseases or conditions. People who have spinal cord injuries, traumatic brain injury, cerebral palsy, muscular dystrophy, spina bifida, multiple sclerosis, demyelinating diseases, myelopathy, progressive muscular atrophy, amputations, or paralysis often benefit from complex rehabilitative technology. The assistive devices are individually configured to help each person with his or her own unique disability.

Check your Progress - 2

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

3. What are the activities of daily living in rehabilitation?

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4. What are self-help devices?

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12.8. ENVIRONMENTAL CONTROL UNITS

Living with a severe disability can be devastating. The loss of independence and control of one's environment can lead to low self-esteem and depression. Using an environmental control unit to increase independence and control can improve a person's self-esteem by allowing them to participate in everyday living, school, work, and leisure activities. This increased independence can reduce the need for a paid attendant, cut down on demands of the family, and provide some much-needed privacy for the individual with a disability.

An Environmental Control Unit (ECU) is an electronic device that assists a person with a substantial disability to control their surroundings. It helps them perform many daily tasks and make choices independently.

An Environment Control Unit (ECU) is a specially designed remote control. A wide range of electrical devices including lights, telephones, computers, air conditioning, electric beds, televisions, DVDs etc. can be operated 'out of the box'. Many other devices can be controlled with a small amount of additional equipment. The user of an ECU controls the system by operating a switch or screen (including smart phones) matched to their physical ability. Speech recognition and other input methods are also available.

The benefits of an Environmental Control Unit impact more than the direct user. These systems can help relieve the pressure of providing

constant care to a loved one by passing control of many activities back to the individual.

It is made up of four basic components:

The input method, menu, processor and activity output. The input method is the interface between the human user and the processor. This is how the user will access the unit. The menu displays the present status of the system and helps in the selection of the commands. The processor consists of the electronic that process the command and execute the action. The activity output consists of the devices that will be controlled (lights, TV, telephone, etc.) and any additional modules necessary to carry out the action.

Purpose of ECUs

The purpose of Environment Control (EC) equipment is to provide a “technical bridge” which gives users independent and spontaneous control of devices that able-bodied persons take for granted. Common devices include television, telephone, computer and lights.

Types of ECUs

Environmental control units (ECUs) are devices that allow people with mobility impairments to operate electronic devices, including televisions, computers, lights, appliances, and more. There are many commercially available ECU devices; however, they typically fall into two broad categories - stand-alone and computer-based devices. Stand-alone ECUs contain their own electronics and do not utilize a computer to function. Many of these units can be activated by a switch, which acts as the interface between the user and the unit. In contrast, a computer-based ECU consists of a software program and the necessary peripherals that allow a computer to function as an ECU.

A computer-based system consists of a software program and the necessary peripherals that allow a computer to function as an ECU. The advantages to using this type of system are the relatively low cost (the software plus a personal computer is cheaper than most stand-alone units) and a predetermined access method if the user already accesses the computer. Disadvantages include the need to have the computer running at all times, the need for visual and/or physical access to the computer from various positions, and the lack of transportability of the system. The system can be made more transportable by using a laptop computer instead of a personal computer.

However, placement of the laptop computer for viewing and access in different environments becomes an issue.

Stand-alone ECUs contain their own electronics and do not utilize a computer to function. Many of these units can be activated by a switch, which acts as the interface between the user and the unit. The switch can be a single switch (button, leaf, etc.) or a dual switch (sip and puff, rocker, etc.). The switch is used to activate a scan of the menu items or commands. The scan can be automatic or directed.

Automatic scanning is when the user activates the switch to start the scan and the menu items continue to scan until the user activates the switch to make a selection. This can be done with a single or dual switch. Directed scanning involves multiple activations of the switch to move through the

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menu until the desired command is located and activated. This can also be done with a single or dual switch.

Some ECUs can be activated by voice commands. These systems are user dependent, which means that the user trains the unit to his or her voice and that user is the only person who can use the system. The ECU creates a bank of voice models from the training. It then compares the voice commands to the bank of models, and when it finds a match, executes the designated action. An advantage to using voice commands to control the ECU is that the user need not have a consistent physical movement. However, they do need to have a consistent voice pattern. Even with a consistent voice pattern, recognition accuracy is less than 100 percent and the accuracy decrease even more in a noisy environment. The user also needs to have adequate memory skills to remember the command sequence unless he or she has visual access to a display.

All ECUs transmit signals to the devices that will be controlled. House wiring, ultrasound, infrared (IR), or radio frequency (RF) can transmit these signals.

According to the Delaware Assistive Technology Initiative, there are currently four basic types of ECUs available. They are:

- *AC power*. This type of system uses the electrical wiring already in your home. Each item to be controlled (lamp, radio, etc.) is plugged into a control box, which in turn is plugged into an electrical outlet. The user has an input device that communicates with each control box via the existing wiring system. A different control box is needed for each appliance. These systems are inexpensive and easy to install.
- *Infrared.* These ECU devices send an infrared signal to the control unit, which in turn sends another infrared signal to the appliance. This type of ECU is seen in most of our TV and VCR remote controls. In order for the device to work, the remote must be aimed directly at the control box with nothing blocking its path.
- *Radio control.* With this type of device, the remote sends radio waves to the control unit, which then sends the message to the appliance. This is the same technology that powers garage door openers. The remote and the control box can be in different rooms and still work, but the system has a range limit of 50-200 feet. Interference from another nearby control unit is also possible.
- *Ultrasound.* This type of ECU uses high frequency sound waves as the input and output signal. The sound wave will bounce around the room until it reaches the control box and delivers its message. The control box then sends a command signal to the appliance being controlled. The input device and the control box must be in the same room to work.

No matter which type of ECU is selected, a backup system needs to be in place in case of power failure.

12.9. LET US SUM UP

The unique and wonderful concept behind rehabilitation is that it incorporates an individual’s entire situation, taking into account how physical changes may impact one’s activities, emotions, and well-being. With rehabilitation, a team of specialists work together to address all aspects of an individual’s disability. Their overall goal is to improve a person’s

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quality of life, while helping to preserve one's independence and safety. In this unit, you have learnt about various rehabilitation aids, their types, appropriate utilization, advantages and limitations with regard to different disability.

12.10. UNIT – END EXERCISES

1. What is meant by rehabilitation?
2. Who is an orthoptist?
3. State the difference between orthotics and prosthetics.
4. Explain the types of prostheses.
5. Discuss the significance of occupational therapy in rehabilitation.
6. What are the activities of daily living for rehabilitation?
7. Describe the role of self-help devices for rehabilitation.
8. Define environmental control units.
9. Explain the different types of environmental control units.

12.11. ANSWERS TO CHECK YOUR PROGRESS

1. Orthotics is a medical specialty that focuses on the design and application of orthoses. An *orthosis* is an externally applied device used to modify the structural and functional characteristics of the neuromuscular and skeletal system.
2. In medicine, a prosthesis or prosthetic implant is an artificial device that replaces a missing body part, which may be lost through trauma, disease, or a condition present at birth (congenital disorder). Prostheses are intended to restore the normal functions of the missing body part.
3. Activities of Daily Living are all those tasks of everyday life which have a specific value and meaning to individuals, as well as purpose. Occupations are central to a person's identity and competence, and they influence how one spends time and makes decisions.
4. Self- help devices also called assistive devices are those whose primary purpose is to maintain or improve an individual's functioning and independence to facilitate participation and to enhance overall well-being.

12.12. SUGGESTED READINGS

- Medline Plus. (2016.) *Mobility aids.* Retrieved from https://medlineplus.gov/mobilityaids.html
- International Society for Prosthetics and Orthotics. *Prosthetics and orthotics services.* Retrieved from https://www.ispoint.org/page/POservices
- Center on Technology and Disability. (2018). *Assistive technology 101*. Retrieved from https://www.ctdinstitute.org/sites/default/files/file_attachments/CTD-AT101-V4.pdf

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- National Coalition for Assistive & Rehab Technology. (2009). *Complex rehab technology definition.* Retrieved, from http://www.ncart.us/uploads/userfiles/files/CRT%20Definition%206-1-14.pdf
- Self-Help Devices for Rehabilitation. *JAMA.* 1958; 166(13):1659. doi:10.1001/jama.1958.02990130119039
- Bain B, Leger D: "Assistive Technology, an Interdisciplinary Approach." Churchill Livingstone, 1997.
- Cook. A, Hussey S. (1995) "Assistive Technologies: Principles and Practice." Mosby-Year Book, St. Louis, MO.
- Selection Guidelines for Environmental Control Systems, (1997) APT Technology, Inc.

NOTES

UNIT XIII: DEVELOPMENTAL AIDS

STRUCTURE

13.1. INTRODUCTION

Developmental aids are primarily used with children with delayed development, but may also be useful for children who have suffered a neurological insult, whether or not they are showing signs of recovery. Most children function better if they can experience a variety of positions and can be part of activities with others. In this unit, you will gain knowledge about various development aids, developing the development aids using locally available materials, nature of adaptive devices and low-cost aids.

13.2. OBJECTIVES

After reading this unit, the reader shall be able to

- Acquire knowledge about development aids.
- Develop the developmental aids using locally available materials.
- Understand the utility of adaptive devices.
- Realize the advantages of low-cost aids for disabled persons.

13.3. DEVELOPMENTAL AIDS

Developmental aids are the aids used by the disabled children for lying, sitting, standing, balance, use of hands, and communication at different stages of development. Whether or not a particular child needs an aid, and what kind of aid he/she needs, must always be carefully and repeatedly evaluated. An aid that helps a child at one level of development may actually hold him/her back at another.

General principles in using developmental aids

- Always consider the developmental stage of the child.
- An understanding of the home environment of the child is essential (e.g. in some regions a donkey may be a more useful mobility aid than a wheelchair once the child leaves hospital).
- The prevention of secondary disabilities (e.g. contractures or pressure sores) is a major priority in the care of disabled children.
- Always consider the purpose of the aid that you think will help, and ask yourself the following questions:

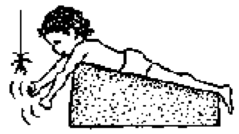
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- How will this aid help this child to function in their daily life?



Figure

Cassio does better on a lower wedge so he can lift up on his elbows (Height is slightly less than length from elbow to armpit)



Figure

Carmen and others with little or no arm or hand control do best when their arms can dangle. She can see them moving when she moves her shoulders

- Will the use of this aid reduce this child's abilities to do other things?
- Will the use of this aid improve the way the child feels about him or herself?
- Who will review this aid to ensure that it is still helping the child and is still the right size for the growing child?
- Who will maintain this aid to ensure that it still works?

When considering aids, we should first understand the child development, those covering the particular disability of the child. Let us see some of the development aids below

Lying aids

Lying face down is a good position for a child to begin to develop control of the head, shoulders, arms, and hands, and also to stretch ***muscles*** in the hips, knees, and shoulders. However, some children have difficulty in this position. For example



Figure

Rosa cannot lift her shoulders. She has to bend her neck far back to lift her head



Figure

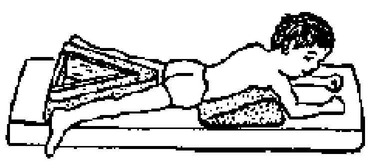
Juan does not have enough control and balance to reach out his arms



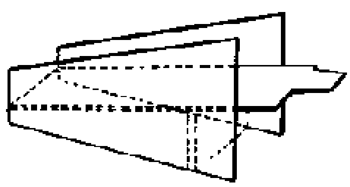
Figure

A firm pillow under the chest may help both these children to lift their heads better and to reach out

A 'wedge' or slanting support is often helpful. The height depends on the needs of the particular child



If necessary, a leg separator can be added.



or sides can be included for the child who needs to be

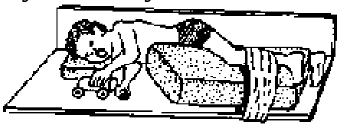
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positionedwith supports or cushions.

Design from *Functional Aids for the Multiply Handicapped.*

Some children are able to control their shoulders, arms, and hands better when lying on one side.

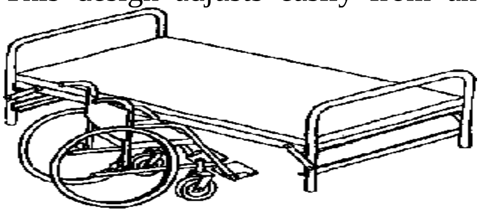
A side-lying frame may be helpful for some children with severe cerebral palsy. Try cushions or padded blocks of different shapes until you find what works best. Use straps only if clearly needed to keep a good position.



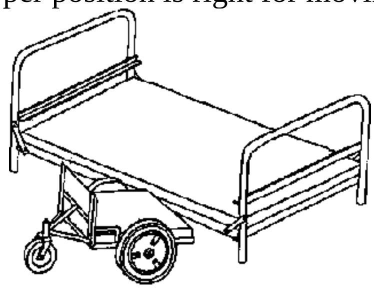
Also see lying frames for straightening hip flexion contractures and lying frames with wheels.

Adjustable Beds

This design adjusts easily from an upper position to a lower position.



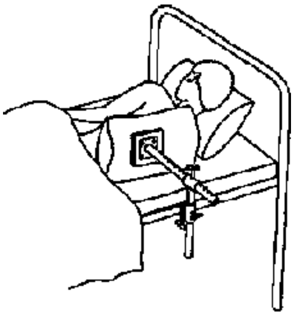
The upper position is right for moving to and from a regular wheelchair.



The lower position is right for moving to and from a low-level wheelchair or 'trolley', which many people use in their houses. These metal beds and wheelchairs are welded together by paraplegic workers**.**

Adjustable Back Support Clamp

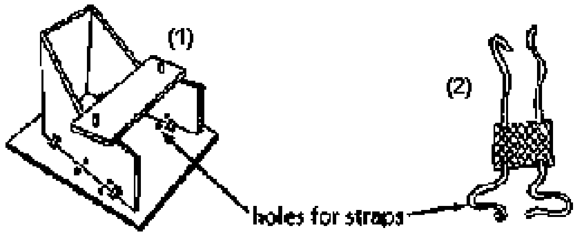
Supporting a severely *paralyzed* person so he lies on his/her side can be difficult. Pillows easily move or slip. This simple clamp helps solve the problem.



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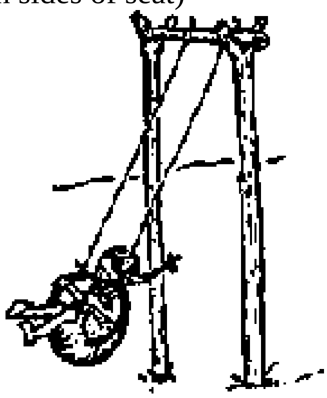
Sitting Aids

A wide variety of early sitting aids are commonly used on cerebral palsy. Special seating *adaptations* for chairs and wheelchairs are also there. Here we include a few more ideas:



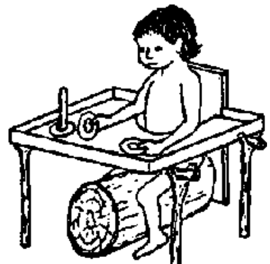
(1) Seat for child with spasticity who has knock-knee contractures (one of many possibilities)

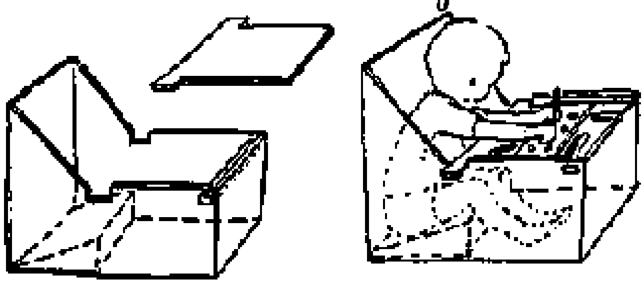
(2) strap for keeping legs apart (one around each leg and tied through holes in sides of seat)



Tire seat or swing bends head, body, and shoulders forward to help control spasticity.

A log or roll seat helps the child with spasticity or poor balance sit more securely with legs spread. Log should be as high as the knees. Leave a little room between the cut-out circle in the table and the child's belly.

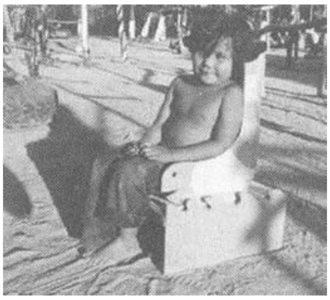




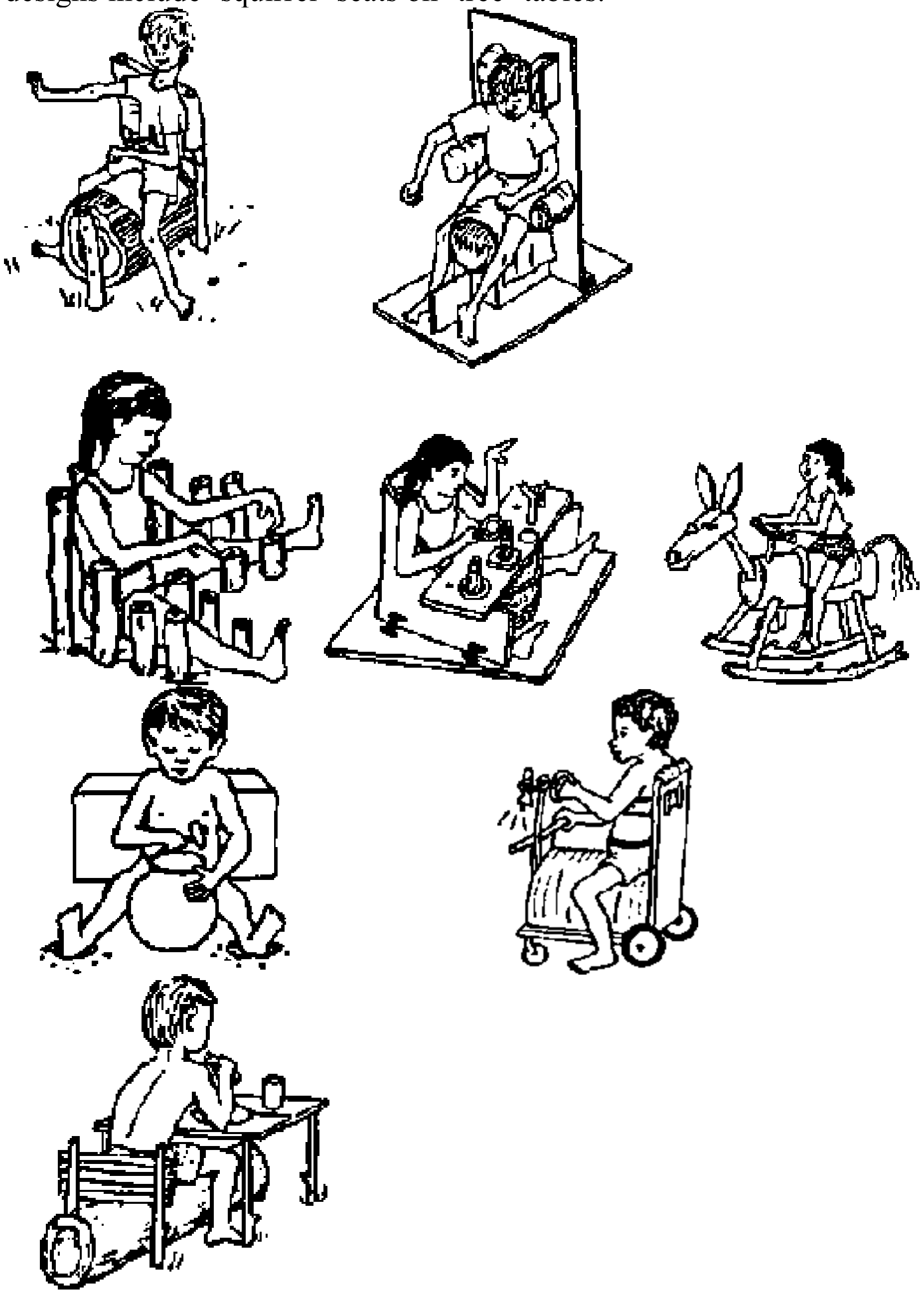
Seat for a child with spasticity whose body stiffens backward

Other Ideas for Holding Legs Apart





A seat and table like this. In the form of a fish on the ocean makes sitting in a special seat fun. So do the village-made toys. The seat can be used for straight leg sitting, or put on top of the table for bent-knee sitting. Other designs include 'squirrel' seats on 'tree' tables.



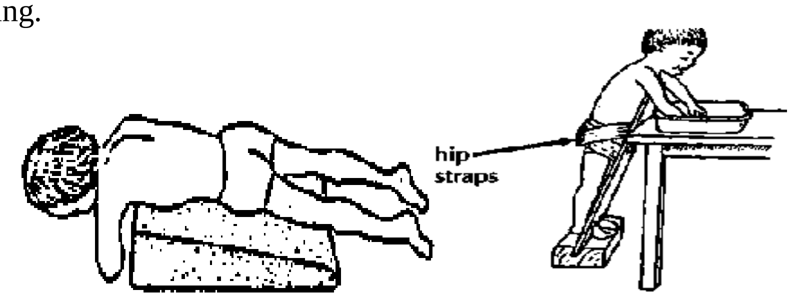
Adapted seating.

Standing aids

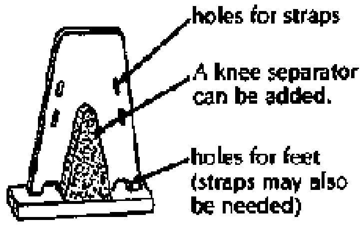
Many children who have problems with balance or control for standing may benefit from standing or playing in a 'standing aid'. Even for the child who may never stand or walk on her own, being held in a standing position with weight on her legs helps *circulation* and bone growth and strength.

Standing Board

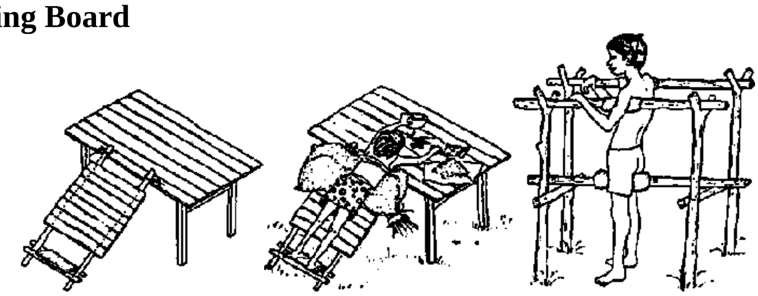
Sometimes a child who does not have enough control or strength to hold his head up when lying, can hold his head up better when sitting or standing.



A simple standing board can help hold the child in a stable position. This one leans against a table.

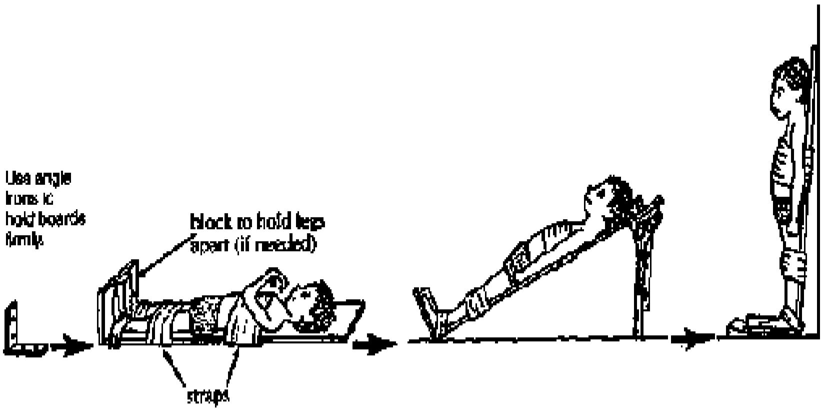


Leaning Board



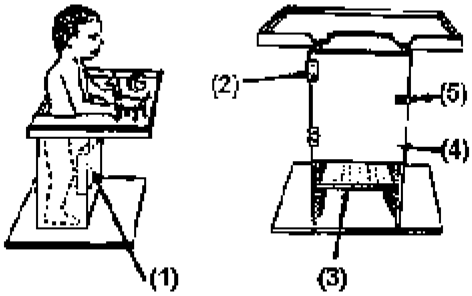
Back-Board

This can be used to gradually bring a child to a standing position. It is especially useful for older children who get dizzy if stood up straight too quickly. This can happen after a spinal cord injury or a long, severe illness. The child can be stood up gradually and for longer each day



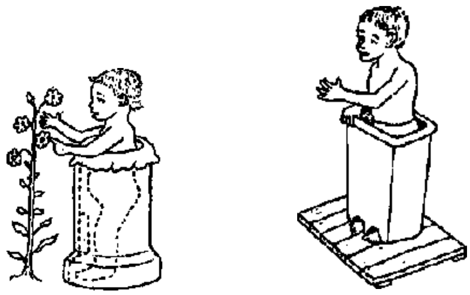
Use angle irons to hold boards firmly

Stand-In Table



(1) Padded knee block
(2) Hinges (cloth or leather)
(3) Adjustable foot board for children of different heights
(4) Door
(5) Clasp

Other Ideas

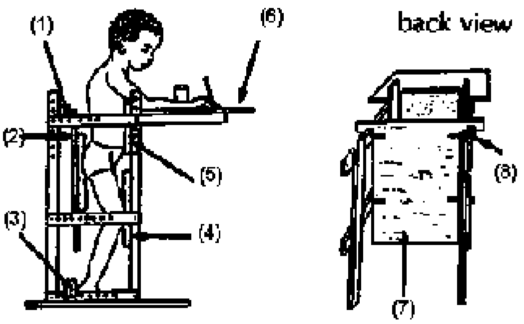


Large tile or cement pipe or hollow log, plastic garbage container (Fasten it to a wide base to keep it from tipping over.)

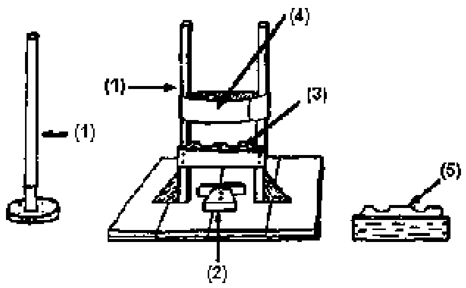
Standing Frames

These are mainly for a child with contractures or painful joints who has difficulty standing straight. The child can gradually be straightened up.

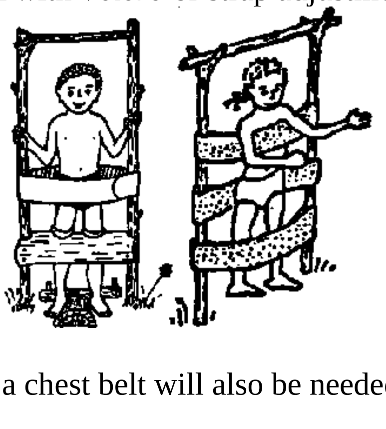
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Adjustable Model
(1) Bolt or pin for adjustment
(2) Adjustable padded hip support
(3) Adjustable padded ankle foot support
(4) Knee pad
(5) Chest pad
(6) Table
(7) Remove backboard to stand child in frame
(8) Bolts or pins for adjustment

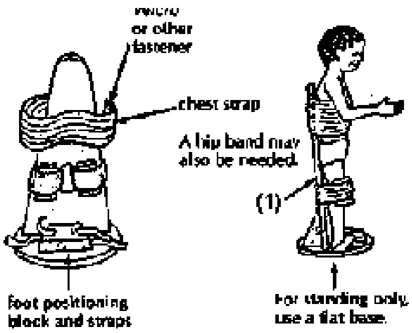


Movable Model
(1) Uprights can be made of wood or metal tubing.
(2) Adjustable foot support
(3) Adjustable board with padded notches for knees
(4) Wide belt of thick cloth with *Velcro* or strap adjustment

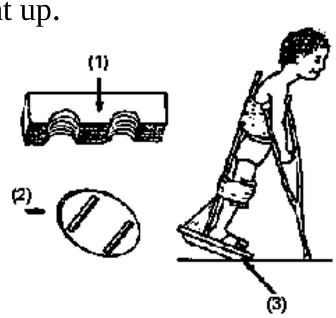


Simple Fixed Model
For some children, a chest belt will also be needed.

Standing-And-Walking Frame
This is a useful aid to begin standing and walking, for children paralyzed or severely affected below the waist (paraplegia, spina bifida, diplegic cerebral palsy).



The back-board should tilt back slightly to let the child stand straight up.



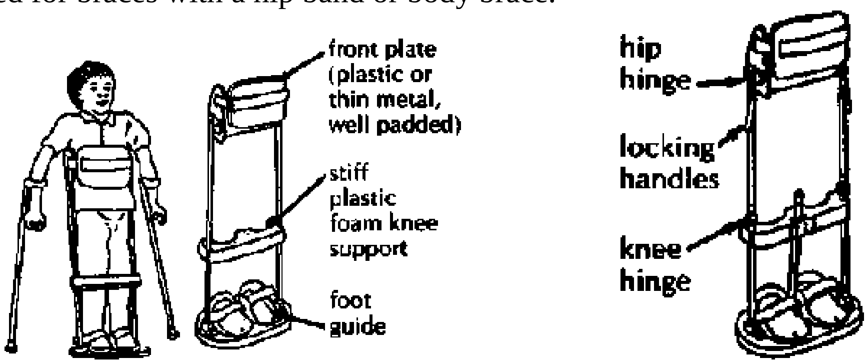
Instead of kneepads, you can hold the knees better using a firm knee support molded form stiff-foam plastic or many layers of cardboard glued together (1).

The base is oval (2) with the longer dimension sideways.

For walking, add runners with a curved front (3). This makes it easier for the child to tilt forward and lift off.

Standing-Walking Brace

This has the same use as the standing-walking frame above, but is especially useful for children who need to learn how to walk before they are fitted for braces with a hip band or body brace.



Design that does not allow sitting   Design with hip and knee hinges to allow sitting

(From *Physically Handicapped Children - A Medical Atlas for Teachers.*)

Check your Progress - 1

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

1. What are developmental aids?

....

....

Aids for balancing and body control

Activities for improving balance are discussed. Here we bring together a few of the aids for balancing that are shown in different parts of this book, together with a few new ones.

Balance Boards





An old drum or barrel makes a good 'roll' for exercise and positioning. A balance board like this rocks less smoothly because the center rocker is so narrow.



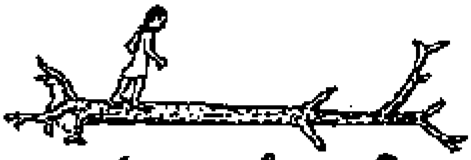


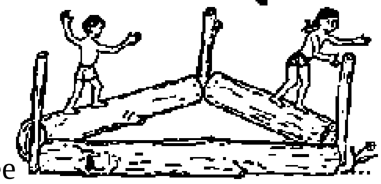
A wider rocker works better



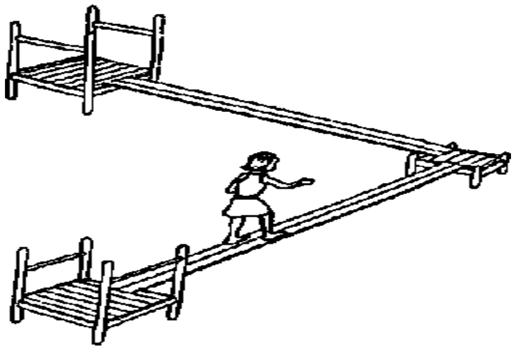
An upright stick can be used at first to help her keep her balance

Balance Beams



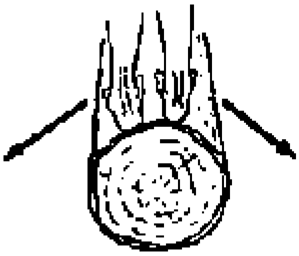


Fallen tree



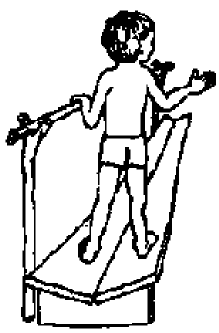
Logs





For the child whose ankles bend in, walking on a log helps bend the ankles outward

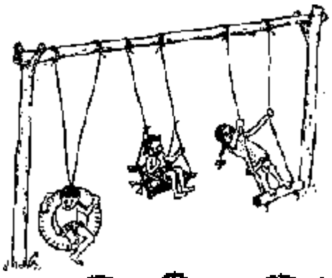


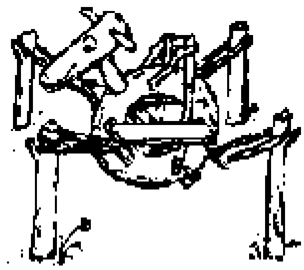


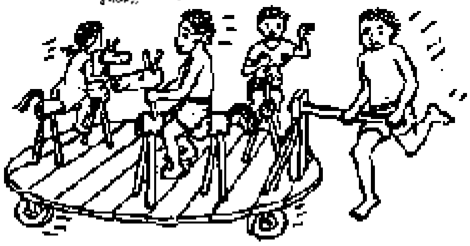
For the child whose ankles bend outward, walking on boards like this helps bend the ankles inward

To improve balance also see swings, rocking horses and merry-go-rounds**.**

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Communication Aids

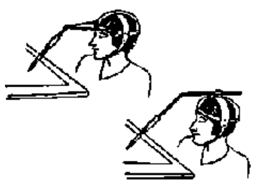
Children who are unable to communicate verbally because of deafness and/or inability to use their motor muscles will often be able to use a communication board or book with pictures of objects, people and actions. If the child is unable to point using a finger, hand, toe or foot, they may well be able to 'eye point'. An attentive carer will be aware that the child is eye pointing, and the use of a communication aid may 'unlock' the child who had previously been assumed to be unable to communicate beyond indicating pleasure or distress. More technological solutions are available using computers with specialized software which enables children to 'speak', but the basic principle of being able to select a pictorial representation of an object or an idea is the same.

Aids to prevent common secondary problems developing in hospital

Preventing foot drop

One of the commonest preventable complications in children with weak legs is the development of foot drop. This should not happen in your hospital. Regular exercises to move the ankles through their full range of movement should be done at least twice a day. The use of tight or heavy bed covers should be avoided, as they may hold weak feet in a bad position. It is best for the feet to rest with the ankles at 90 degrees. This is easily ensured by positioning a roll of blanket or similar material so that the feet are braced in this position.

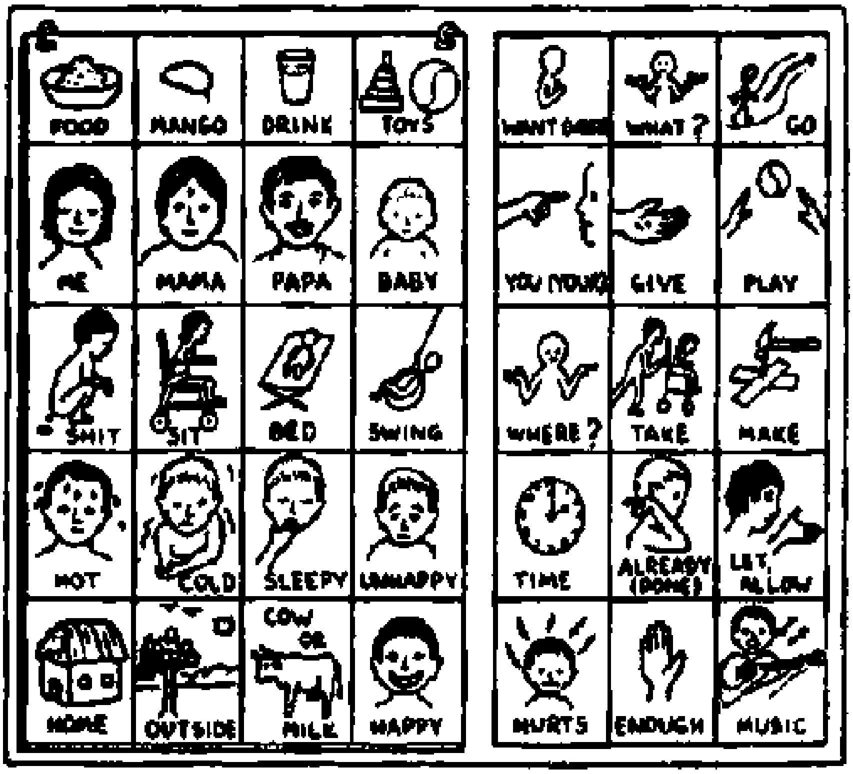






Page turner Aids for painting, writing or pointing

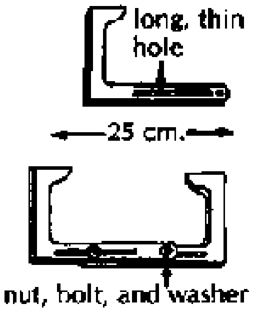
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Communication board

Physical Examination, Measuring and Recording Aids

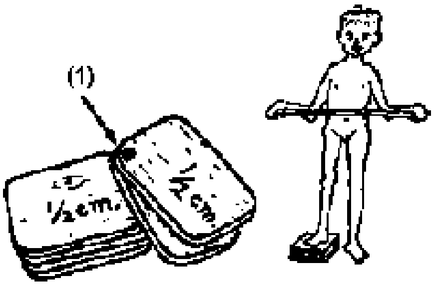
Instrument for leveling hips



Cut 2 pieces of thin plywood like this. Fasten them together so that they slide back and forth.

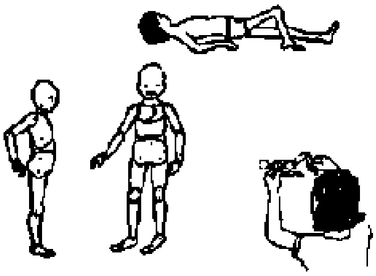


To use, close instrument around child’s waist and push down against hip bones. Then raise or lower shorter leg until the instrument is level

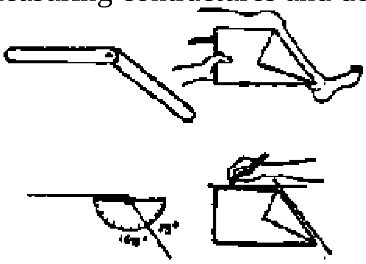


Aid for measuring leg length difference

(1) Cut rectangles of 1/4 inch thick boards and bolt them loosely together at one corner.



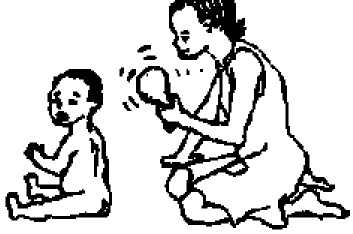
'Flexikins' for measuring contractures and deformities



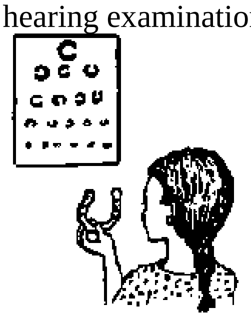
Other methods for measuring contractures



Rib-hump angle measurer



Aids for hearing examination



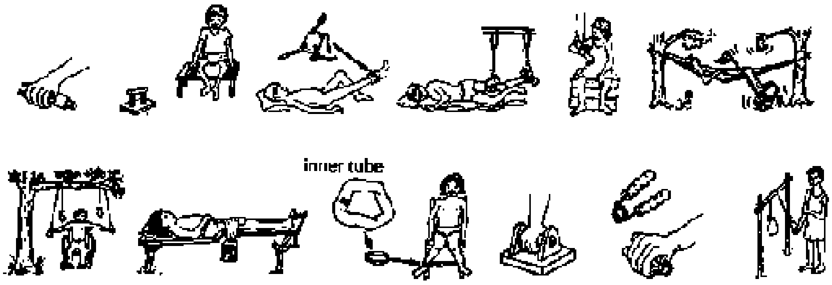
Aids for seeing examination

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Foot Contracture Prevention Aids



Exercise Aids



13.4. DEVELOPMENTAL AIDS USING LOCALLY AVAILABLE MATERIALS

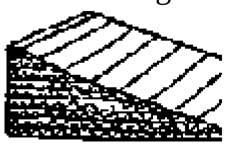
Lying aids

Many children who are ill or who are recovering from illness spend most of their time lying on their back or on their side.

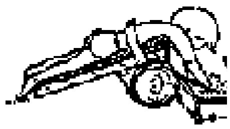
Lying on their front helps to develop trunk and arm strength and stretches muscles in the hips, knees and shoulders. A pillow under the chest helps to release the arms and hands for play.

A wedge is a more substantial version of the same idea, and can be made from material such as stiff foam plastic. Some children who need to have their legs separated because of adductor spasm will need a leg separator or pillow, also made of similar material.

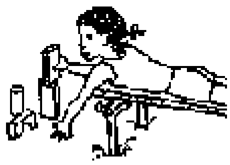
Wedges can be made with:



stiff foam plastic or layers of cardboard



a log and a board with a soft foam cover



a stick frame

Check your Progress -2

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

2. What is the purpose of using a communication aid?

....
....

Sitting aids

The type of sitting aids used will depend on the particular difficulties and developmental stage of the child. Most children with cerebral palsy benefit from being seated in a position in which their ankles, feet and hips are at 90 degrees and their legs are kept apart (abducted). There are many varieties of seats available. For a young child, a corner seat is often helpful. Special seating can also be fun (e.g. the 'steam engine').

Children with spasticity also often benefit from a slight tilt backwards. The position and amount of head support needed depend on the amount of head control and extensor tone.

Standing aids

These may be useful for children who are showing improvement in their motor skills and can be expected to learn to stand independently, but are also useful for children who may never stand independently, because the standing position aids the circulation and also bone growth and strength, particularly of the hip joints. Some children find standing frames difficult to get used to at first, and may need encouragement to use them.

Walking aids

There are a wide variety of these aids available. Perhaps the most useful is a walking frame that goes behind the child and which can have a variety of attachments depending on the child's balance and arm strength. Some parallel bars are also useful and will need to be set at different heights depending on the size of the child.

A selection of underarm crutches, elbow crutches and tripod sticks will be useful. These can often be made locally, and will need to be of various sizes.

Note that underarm crutches can cause nerve damage if the child hangs off the crutches when attempting to walk.

Eating and drinking aids

Utensils with thick handles and cups with handles on both sides may be easier to use for children who find gripping difficult. It may be helpful to put a non-slip material underneath a bowl or plate to stop it sliding while the child is eating (a damp cloth works very well). Eating and drinking aids must be easy to wash.

Chair and wheelchair cushions

For the child who has lost sensation in their bottom, the type of seat cushion used is very important, especially if the paralysis makes it difficult for them to lift up or change positions. All patients with spinal cord injury should use a good cushion. Sitting directly on a canvas seat or a poorly padded wooden seat will cause pressure sores.

Good cushions can be made of 'microcell' rubber, which is fairly firm. It works best if it is cut and shaped to reduce pressure on bony areas.

A useful low-cost way to make a fitted cushion is to build a base out of many layers of thick cardboard glued together, and then cover it with a 2 or 3 cm thick layer of sponge rubber.

Wet the cardboard and sit on it wet for 2 hours, so that it moulds to the shape of the bottom. Then let it dry, and varnish it.

Before making a specially fitted cushion, you can make a 'mould' of the patient's bottom by having them sit in a shallow container of soft clay, mud or plaster. Note the bony hollows and form the seat to fit them.

Air cushions made from bicycle tyre inner tubes are excellent for the prevention of pressure sores, and for bathing on a hard surface. Use one, two or more tubes, depending on the size of the tube and the size of the child. Bind loops of the tubes together with thin straps of inner tube. Then pump in enough air to ensure that the whole of the child's bottom is held up by air.

Prevention of pressure sores

A 'waterbed' (a bag-like mattress filled with water) or air mattress also works well. In some countries, an excellent mattress material is made from rubber-coated coconut fibre. Urine can be washed out of the material by pouring water through it. Because this material is costly, a rehabilitation programme in Bangladesh has adopted the practice of cutting a square out of a cheap mattress and replacing it with a square of the coconut fibre sponge.

Other aids

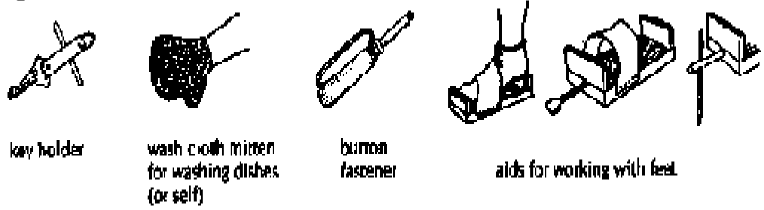
Here is a brief summary of some of these to give you basic ideas and tell you where to look. We also give a few ideas of aids not shown before.



Eating and Drinking Aids

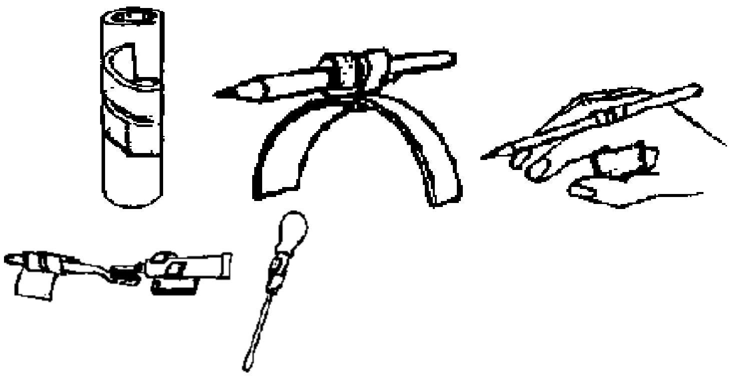


Toileting Aids



Holding and Reaching Aids

Spiral Holding Aid

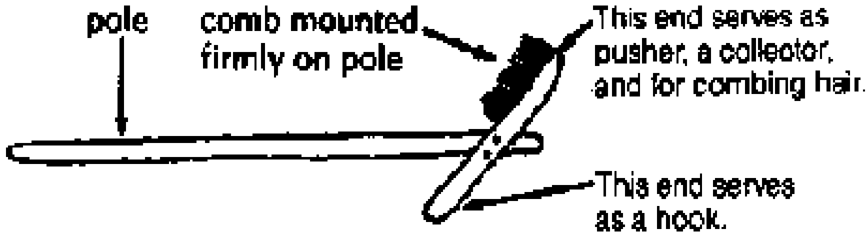


Cut a piece of heavy rubber tube like this, bolt it to a piece of plastic pipe or bamboo.

NOTES

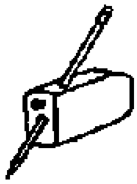
Use it like this. Spiral attached to washstand

Note: For larger objects such as a knife or ruler, the spiral can be made of garden hose.



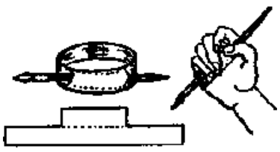
ALL-PURPOSE TOOL

WRITING AIDS

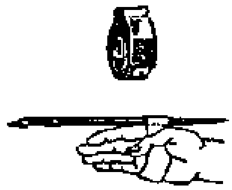




Pencil in a large gum eraser   Loop of car inner tube

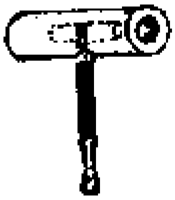






Leather or thick cloth   Velcro

Bamboo or tube or hose



Rubber or plastic tubing

13.5. ADAPTIVE DEVICES

Aids and adaptive devices are the supporting devices used by persons with disabilities in improving their quality of life in terms of mobility, communication and for performing their daily activities. There is a wide range of adaptive devices available to meet the needs of person with disabilities. By use of these Aids & adaptive devices, people with disabilities become independent and their participation in the society increases.

Following are some examples of aids & adaptive devices given below:

- **Aids for Daily Living:** Which covers self-help aids for use in activities such as eating, bathing, cooking, dressing, toileting, home maintenance, etc. These include modified eating utensils, adapted books, pencil holders, page turners, dressing aids, adapted personal hygiene aids.

- **Mobility Aids:** Devices that help people move within their environment, electric or manual wheelchairs, modification of vehicles for travel, scooters, crutches, canes and walkers.
- **Home/workplace modifications:** structural adaptations that remove or reduce physical barriers such as ramps, lifts, modification in the bathroom to make it accessible, automatic door openers and expanded doorways etc.
- **Seating and Positioning:** Adapted seating, cushions, standing tables, positioning belts, braces and wedges to maintain posture, and devices that provide body support to help people perform a range of daily tasks.
- **Alternative and augmentative communication devices (AAC):** These devices help people with speech impairments or person having low vocal volume to communicate such as speech generating devices, voice amplification aids and communication software. For visually impaired person, devices as magnifier**, Braille or speech output devices**, large print screens, closed circuit television for magnifying documents, etc.
- **Prosthetics and Orthotics:** Replacement or augmentation of body parts with artificial limbs or other orthotic aids such as splints or braces. There are also prosthetics to assist with cognitive limitations or deficits, including audio tapes or pagers (that function as s or reminders).
- **Vehicle Modifications:** Adaptive driving aids, hand controls, wheelchair and other lifts, modified vans, or other motor vehicles used for personal transportation.
- **Sensory aids for vision/hearing impaired:** such as magnifiers, large print screens, hearing aids, visualizing systems, Braille and speech/telecommunication output devices;
- **Computer Access Aids:** Head sticks, light pointers, modified or alternate keyboards, switches activated by pressure, sound or voice, touch screens, special software, voice to text software that enable persons with disabilities to use a computer. This category includes speech recognition software.
- **Recreational aids to enable participation in social/cultural events and sports:** Devices to enable participation in sports, social, cultural events which includes audio design for movies, adaptive controls for video games etc.
- **Environmental Controls:** Electronic systems that help people control various appliances, switches for telephone, TV, or other appliances which are activated by pressure, eyebrows or breath

NOTES

Check your Progress - 3

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

3. What are adaptive devices?

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………………………………………………………………………………………………………

13.6. LOW COST AIDS

For persons with disabilities, assistive devices ensure personal mobility, communication and often mean the difference between a life of seclusion and a life of activity. To ensure the best possible outcomes for persons with disabilities, a comprehensive habilitation and rehabilitation programme that includes the availability of aids and appliances as per the choice and requirement of the individual is essential. Habilitation is the process of helping disabled people attain, keep or improve skills and functioning for daily living.

The low-cost assistive aids are very useful for persons with disabilities. The United Nations Convention on the Rights of Persons with Disabilities, which India ratified in 2007, speaks of the right to personal mobility for persons with disabilities. State parties are supposed to facilitate access to quality mobility aids, devices, assistive technologies and forms of live assistance and intermediaries (like personal assistants, interpreters and service animals), including by making them available at affordable cost. Currently, assistive devices are exempt from charges like Value Added Tax at the state level, central excise, customs and additional customs duties. These devices include wheelchairs, hearing aids and implants, prosthetics and orthotics that are worn to correct foot and ankle problems, artificial limbs and parts, crutches, cycle carriages, intraocular lenses and simple spectacles.

Most of the assistive aids used by disabled persons are highly expensive and depends upon the nature of disability. There arouses a responsibility to introduce alternative aids made using low cost materials.

For example, materials available in our day to day life such as wooden logs, small pieces of plastic, pen, scale, rubber etc. may be utilized as sources for making low cost alternative aids as we have discussed earlier in this unit in developmental aids. For example, a 3D printer is used to create adaptive aids for arthritis patients, which could help people perform daily tasks such as opening doors or getting dressed. The devices are a small fraction of the cost of commercial alternatives, meet or improve on existing standards, and are customizable for individual patients. Adaptive aids, which are typically simple pieces of plastic, are available to make it easier for arthritis patients to grip and manipulate objects.

13.7. LET US SUM UP

This unit dealt with the types of aids that should be available for disabled children. There are many conditions which can cause disability, and the aim of the developmental aids is to minimize disability and maximize independent function. It should be noted that some positions which may appear desirable (e.g. the upright walking posture in a child with excessive extensor tone) may adversely affect the child's ultimate mobility. The advice of a trained paediatric physiotherapist is invaluable.

13.8. UNIT – END EXERCISES

1. What are Developmental aids?
2. Enumerate the general principles in using the developmental aids.
3. Explain the various developmental aids for lying, sitting and standing.
4. List the sources from which alternative low-cost aids are developed.
5. Discuss the various adaptive devices used by disabled persons.

13.9. ANSWERS TO CHECK YOUR PROGRESS

1. Developmental aids are the aids used by the disabled children for lying, sitting, standing, balance, use of hands, and communication at different stages of development.
2. Children who are unable to communicate verbally because of deafness and/or inability to use their motor muscles will often be able to use a communication board or book with pictures of objects, people and actions.
3. Aids and adaptive devices are the supporting devices used by persons with disabilities in improving their quality of life in terms of mobility, communication and for performing their daily activities.

13.10. SUGGESTED READINGS

➢ Werner D (1999) *Disabled Village Children: a guide for community health workers, rehabilitation workers and families.* Palo Alto, CA: Hesperian Foundation.
➢ El Masri WS (2006) Traumatic spinal cord injury: the relationship between pathology and clinical implications. *Trauma*, 8, 29–46.

UNIT XIV: RESEARCH IN DISABILITY REHABILITATION

STRUCTURE

14.1. INTRODUCTION

Validated research on specific rehabilitation interventions and programmes for people with disabilities including medical, therapeutic, assistive, and community-based rehabilitation is limited. Rehabilitation lacks randomized controlled trials widely recognized as the most rigorous method of testing interventions. Lack of reliable research hinders the development and implementation of effective rehabilitation policies and programmes. This unit attempts to brief the concept of research in disability and rehabilitation. The need and scope of research in the field of disability and rehabilitation, problems faced by rehabilitation specialists in research and qualities of a good research worker in disability area are discussed.

14.2. OBJECTIVES

After reading this unit, the reader shall be able to

- Acquire knowledge of research in disability rehabilitation.
- Understand the need and scope of research in the field of disability and rehabilitation.
- Analyze the problems faced by rehabilitation specialists in research.
- Realize the qualities of good research worker in disability area.

14.3. RESEARCH IN DISABILITY REHABILITATION

Lack of reliable research hinders the development and implementation of effective rehabilitation policies and programmes. Research on rehabilitation has several characteristics that differ fundamentally from biomedical research, and which can make the research difficult:

- There is no common taxonomy of rehabilitation measures.

- Rehabilitation outcomes can be difficult to characterize and study given the breadth and complexity of measures. Rehabilitation often employs several measures simultaneously, and involves workers from different disciplines. This can often make it difficult to measure changes resulting from interventions, such as the specific outcomes from therapy compared to an assistive device where the two are used concurrently.
- Few valid outcome measures for activity limitations and participation restrictions can be reliably scored by different health professionals within a multidisciplinary team.
- Sample sizes are often too small. The range of disabilities is extremely large and conditions diverse. Rehabilitation measures are highly individualized and based on health condition, impairments, and contextual factors, and often the number of people within homogeneous groups that can be included in research studies are small. This may preclude the use of controlled trials.
- The need to allow for participation of people with disabilities in decision-making through the process of rehabilitation requires research designs and methods that may not be considered rigorous under current grading systems.
- Research controlled trials, which require blinding and placebo controls, may not be feasible or ethical if services are denied for control groups.

14.4. NEED AND SCOPE OF RESEARCH IN THE FIELD OF DISABILITY AND REHABILITATION

More research on rehabilitation in different contexts is needed, particularly on:

- Link between rehabilitation needs, receipt of services, health outcomes (functioning and quality of life), and costs;
- Access barriers and facilitators for rehabilitation, models of service provision, approaches to human resource development, financing modalities, among others;
- Cost–effectiveness and sustainability of rehabilitation measures, including community-based rehabilitation programmes. Obstacles to strengthening research capacity include insufficient rehabilitation researchers, inadequate infrastructure to train and mentor researchers, and the absence of partnerships between relevant disciplines and organizations representing persons with disabilities.

Better data are needed on service provision, service outcomes, and the economic benefits of rehabilitation.

Evidence for the effectiveness of interventions and programmes is extremely beneficial to:

- guide policy-makers in developing appropriate services
- allow rehabilitation workers to employ appropriate interventions

■ support people with disabilities in decision-making. Long-term longitudinal studies are needed to ascertain if expenditure for health and health-related services decreases if rehabilitation services are provided. Research is also needed on the effect rehabilitation has on families and communities, for example, the benefits accrued when caregivers return to paid work, when support services or ongoing long-term care costs are reduced, and when persons with disabilities and their families feel less isolated.

A broad approach is required as benefits of rehabilitation often accrue to a different government budget line from that funding rehabilitation.

Relevant strategies for addressing barriers in research include the following:

- Involve end-users in planning and research, including people with disabilities and rehabilitation workers, to increase the probability that the research will be useful.
- Use the ICF framework to help develop a global common language and assist with global comparisons.
- Use a range of methodologies. More research such as that by the Cochrane Collaboration (Rehabilitation and Related Therapies) is needed when feasible. Alternative, rigorous research methodologies are indicated, including qualitative research, prospective observational cohort design, or high-quality, quasi-experimental designs that suit the research questions, including research studies on CBR.
- Systematically disseminate results so that: policy across government reflects research findings, clinical practice can be evidence based, and people with disabilities and their families can influence the use of research.
- Enhance the clinical and research environment. Providing international learning and research opportunities will often involve linking universities in developing countries with those in high-income and middle-income countries. Countries in a particular region, such as South-East Asia, can also collaborate on research projects.
- Increase research and data on needs, type and quality of services provided, and unmet need (disaggregated by sex, age, and associated health condition).
- Improve access to evidence-based guidelines on cost-effective rehabilitation measures.
- Disaggregate expenditure data on rehabilitation services from other health care services.
- Assess the service outcomes and economic benefits of rehabilitation.

14.5. SCIENCE AND SCIENTIFIC THINKING

Science affects us all, every day of the year, from the moment we wake up, all day long, and through the night. To make it clear how deeply science is interwoven with our lives, just try imagining a day without scientific progress. We can’t live even a moment without science.

Science is not merely a collection of facts, concepts, and useful ideas about nature, or even the systematic investigation of nature, although both are common definitions of science.

Science is a method of investigating nature a way of knowing about nature--that discovers reliable knowledge about it. In other words, science is a method of discovering reliable knowledge about nature. There are other methods of discovering and learning knowledge about nature, but science is the only method that results in the acquisition of reliable knowledge.

Science is valued by society because the application of scientific knowledge helps to satisfy many basic human needs and improve living standards. Science is important because it influences most aspects of everyday life, including food, energy, medicine, transportation, leisure activities and more. Science improves human life at every level, from individual comfort to global issues. Scientific knowledge allows us to develop new technologies, solve practical problems, and make informed decisions, both individually and collectively. Because its products are so useful, the process of science is intertwined with those applications. New scientific knowledge may lead to new applications. The most important role of science is to sustain that sense of awe and wonder in young people that comes from exploring and understanding the natural and technological world. Because science can make a unique difference in a child's life, it is important for it to be a central part of the school curriculum.

Science influences society through its knowledge and world view. Scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment.

Scientific thinking refers to both thinking about the content of science and the set of reasoning processes that permeate the field of science. Induction, deduction, experimental design, causal reasoning, concept formation, hypothesis testing, and so on. Scientific thinking refers to the thought processes involved in scientific activities, ranging from theory building and experimental design to data interpretation and scientific argumentation. The skills-observe, compare, sort and organize, predict, experiment, evaluate, and apply are the seven essential steps to scientific thinking.

Learning skills to support scientific thinking is an important part of a young child's development. When encountered with a problem, knowing which skills to utilize, the manner in which to use them and how to work through a process in a logical fashion are essential to growth in understanding.

Scientific Thinking in Research

When one uses the scientific method to study or investigate nature or any phenomena, one is practicing scientific thinking. All scientists practice scientific thinking, of course, since they are actively studying nature and investigating any phenomenon by using the scientific method.

Inquiry-based science challenges students' thinking by engaging them in investigating scientifically orientated questions where they learn to give priority to evidence, evaluate explanations in the light of alternative explanations and learn to communicate and justify their decisions.

Characteristics of Scientific research

- Objectivity: Scientific knowledge is objective.
- Verifiability: Science rests upon sense data, i.e., data gathered through our senses eye, ear, nose, tongue and touch.
- Ethical Neutrality: Science is ethically neutral.
- Systematic Exploration
- Reliability
- Precision
- Accuracy
- Abstractness

The Importance of Scientific Research.

Scientific research brings together observations, knowledge and data to solve problems, invent solutions and develop new products. This applied science allows individuals, industries and countries to test information by transforming abstract theories into practical learning.

But to qualify as good research, the process must have certain characteristics and properties. It must, as far as possible, be controlled, rigorous, systematic, valid and verifiable, empirical and critical.

Check your Progress - 1

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

1. State the need for research in disability and rehabilitation

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....

2. What do you mean by scientific thinking?

....

....

14.6. PROBLEMS FACED BY REHABILITATION SPECIALISTS IN RESEARCH

Lack of Scientific Training: Many rehabilitation specialists undertake research work without having actual knowledge of the research methods. They just look for similar studies and copy the methodologies listed in it. Even the research guides do not have a thorough knowledge of the various methodologies. This scenario warrants the need for some sort of short-term training to be imparted to rehabilitation specialists prior to undertaking research activities.

Insufficient Interaction: There is no proper interaction between rehabilitation specialists and the special schools or any other similar institutions. This leads to a great deal of data going untapped. Interaction programs should be organized between them on a regular basis. This will highlight what issues need to be researched, what data is required for conducting research, and how the study will be useful.

Lack of Cooperation: Most of the rehabilitation specialists are of the opinion that the sample they have taken for their study and the institutions where they are associated extend less or no cooperation with regard to research. This affects the research studies.

Inadequate Assistance: Rehabilitation specialists have to cope with the non-availability of trained assistants to help the researcher and lack of adequate and timely secretarial assistance, which affects the schedule of their research study.

Improper Reference Management: Much of the precious time of the researchers is spent in looking for books, reports, newspapers, etc. related to disability, rather than searching relevant information from them.

Lack of confidence: Lack of confidence is one of the most common problems among researchers. Researchers with low self-esteem feel less motivated thereby affecting the quality of the work.

Time management: Spending ample time in learning the skills and practical implementation consumes a lot of time. In such a scenario, taking out time for intense research and to draft a top-notch research paper becomes impossible.

14.7. QUALITIES OF GOOD RESEARCH WORKER IN DISABILITY AREA

Researcher is a person who is conducting research. The Success of a research work to a great extend depends upon the qualities of the researcher. A good researcher represents a great responsibility since it is not simple to assemble in concise manner all the important qualities of a good researcher.

No research can be a success without good researchers, although it is really difficult to find adequate number of good researchers who are genuinely motivated towards applied or basic research. A researcher in disability has to meet experts in the field of special education and has to discuss variety of topics. In order to produce best results, a researcher should have variety of qualities both general and specific.

A) General Qualities

- ✓ **Scientific mind**

A researcher in the area of disability must have a scientific mind. He/she should not be influenced or guided by superficial facts, should give up personal likes and dislikes. The researcher should be unbiased and must have practical experience and emotional maturity to deal with the problems related to disability, so that he/she can fully utilize the efforts to gain scientific knowledge and discoveries.

- ✓ **Seeker of truth and knowledge**

A researcher is a seeker of truth. So the researcher must be truthful and sincere and must have desire for the knowledge. He/she must be prepared to make any type of sacrifice in terms of time, money and energy to find out the real truth. Truthfulness corresponds to the desire for accuracy of observation and precision of statement. A researcher must be scrupulously honest and must have intellectual integrity.

- ✓ **Alertness, insight and imagination**

A scientific mind must always be alert to appreciate minute changes in situations. He must have the mind to work under all circumstances. A researcher should be accurate in observation, quick in perception and statement. He must be disciplined. He must have a high degree of imaginative power.

- ✓ **Quick power of understanding and ability for explaining**

The researcher must have thorough knowledge of disability and rehabilitation. The researcher must have good communicative skill and must possess ability to put across ideas to others and should have the ability to grasp things quickly.

- ✓ **Trained and educated**

A researcher must have sufficient experience and training in the area of disability and rehabilitation to understand analyse and solve the problems. The researcher must have an analytical mind and must be acquainted with the latest techniques of research**.**

- ✓ **Patient and educated**

A researcher must have the quality of patience. A research combines in itself success and failure. A researcher must not feel defeated if the desired outcome does not come forth at the expected time. Many years may be required to complete the project. The researcher should not give up the hope in the meantime and must have courage and conviction and need to possess social qualities like pleasant manners, humorousness etc.

B) Specific Qualities

- ✓ **Knowledge of the technique of research.**

The research worker should possess intimate knowledge of the technique that is to be applied to the problem. In the absence of such knowledge the research worker is likely to commit methodological errors.

- ✓ **Knowledge of the subject**

The researcher must have a complete knowledge in the area of disability. This knowledge helps in preparing forms of questionnaire and schedule to get proper information.

- ✓ **Personal taste in the study**

The research worker must take personal interest in the study. A forced work is often very monotonous and tiresome.

- ✓ **Unbiased attitude**

The research worker must be unprejudiced and free from all preconceptions. He/she must maintain an open mind towards the subject under study.

- ✓ **Familiarity about the informants**

The research worker must be familiar with the people of study. Only when the researcher is familiar, he can gather information easily. Further their views can be appreciated properly.

Check your Progress - 2

Note a. Write your answer in the space given below

b. Compare your answer with those given at the end of the unit.

3. List down some of the problems faced by rehabilitation specialists in research.

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....

4. What are the general qualities of a good research worker in the area of disability?

....

....

14.8. LET US SUM UP

In this unit you have learnt about the conceptual view of research in disability and rehabilitation, need and scope of research in the field of disability and rehabilitation, problems faced by rehabilitation specialists in research and qualities of a good research worker in disability area. The reader would get a clear-cut view of the role of rehabilitation specialists in research and also the need for in depth research on the multifarious problems that exists in the area of disability and rehabilitation.

14.9. UNIT – END EXERCISES

1. Define research.
2. Write the probable areas of research in disability and rehabilitation.
3. Discuss the need and scope of research in disability and rehabilitation.
4. What is the importance of scientific thinking in research?
5. Explain the problems faced by rehabilitation specialists in research.
6. Describe the general and specific qualities of a good research worker in disability area.

14.10. ANSWERS TO CHECK YOUR PROGRESS

1. Link between rehabilitation needs, receipt of services, health outcomes (functioning and quality of life), and costs; Access barriers and facilitators for rehabilitation, models of service provision, approaches to human resource development, financing modalities, among others; Cost–effectiveness and sustainability of rehabilitation measures, including community-based rehabilitation programmes.
2. Scientific thinking refers to the thought processes involved in scientific activities, ranging from theory building and experimental design to data interpretation and scientific argumentation.
3. Lack of Scientific Training, Insufficient Interaction, Lack of Cooperation, Inadequate Assistance Improper Reference Management, Lack of confidence and Time management.
4. Scientific mind, Seeker of truth and knowledge, Alertness, insight and imagination, Quick power of understanding and ability for explaining, Trained and educated and Patient and educated etc.

14.11. SUGGESTED READINGS

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DISTANCE EDUCATION – CBCS-(2018-19 ACADEMIC YEAR ONWARDS)

Model Question Paper

M.A. (CHILD CARE AND EDUCATION)

EDUCATION OF CHILDREN WITH SPECIAL NEEDS

TIME 3 hours   Maximum 75 Marks

Part – A (10X2=20 Marks)

Answer all questions

1. State different types of special children.
2. List the technological and special aids used in the education of visually impaired children.
3. Define the term mental retardation.
4. What is integrated education?
5. What do you understand by the term speech and hearing impairment?
6. Who are gifted children?
7. Highlight the need for awareness programs in disability using mass media.
8. Mention the various approaches to therapeutic rehabilitation services.
9. What are environmental control units?
10. Elicit the scope of research in disability and rehabilitation.

Part – B (5X5=25 Marks)

Answer all questions choosing either (a) or (b)

11. a. Explain the different types of hearing defects.

(or)

b. Describe the role of teacher in the education of speech impaired children.

12. a. Elaborate the educational strategies for socially and culturally disadvantaged children.

(or)

b. Describe the characteristics of visually impaired children.

13. a. How will you teach gifted children in regular classroom?

(or)

b. Explain the need for integrated education to the special children in Indian context.

14. a. Explain the different categories of mentally retarded children.

(or)

b. Elicit the educational provisions for the physically handicapped in India.

15. a. Differentiate occupational therapy and physical therapy.

(or)

b. Explain the various developmental aids for lying, sitting and standing.

Part – C (3X10=20 Marks)

Answer any 3 out of 5 questions.

16. Explain the categories of visual impairment and provision for education of visually impaired children.
17. Discuss the salient features of educational programme to the educable and trainable mentally retarded children.

18. Critically evaluate the identification procedures in giftedness.
19. What are adaptive mobility devices and how shall the training be given with adaptive mobility devices?
20. Discuss the qualities of a good research worker in disability rehabilitation.